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Potential Health and Environmental Hazards of Uranium Mine Wastes Volume 3. Appendixes

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A MANUAL ON COSTS

FOR THE PRIMARY PURPOSE OF PROVIDING ORIENTATION
TO THE SMALLER MANUFACTURER IN THE WORK GLOVE INDUSTRY

ON

KEY ELEMENTS OF PRODUCT COSTING
AND COST MANAGEMENT

FINAL REPORT FOR THE DEPARTMENT OF COMMERCE
UNDER GRANT #99-26-07112-10
FOR THE PERIOD SEPTEMBER 15, 1980 THRU DECEMBER 14, 1982

REPRODUCED BY
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NOVEMBER 1982

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AND COST MANAGEMENT

THE COST ACCOUNTING SEGMENT OF THE
WORK GLOVE INDUSTRY
TECHNICAL ASSISTANCE PROJECT

FINAL REPORT FOR THE DEPARTMENT OF COMMERCE
UNDER GRANT #99-26-07112-10
FOR THE PERIOD SEPTEMBER 15, 1980 THRU DECEMBER 14, 1982

NOVEMBER 1982

PREPARED FOR: WORK GLOVE MANUFACTURERS ASSOCIATION
GRAYSLAKE, ILLINOIS

PREPARED BY: J.B. KAPLAN & COMPANY, INC.
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A MANUAL ON COSTS

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A. INTRODUCTION

A. INTRODUCTION

This Manual on Costs has been written as a guide to management (of the smaller companies of the Work Glove Industry) for the development or improvement of product costing and cost management.

When this project was initiated, it was manifest that it would not be feasible to develop any single cost system that would meet the needs of all or most members of the industry, for the following reasons:

There are a considerable number of systems that have shown themselves to be effective in particular environments.

Any particular system is the sum total of all of its parts - its basic concepts, its degree of detail, its methods of data collection, its presentation of output, its emphases, the particular characteristics and circumstances of the company, etc. - and all of these factors very widely.

No universal or optimum system of cost accounting or data collection has emerged, even though there are basic concepts that have potential benefit for all companies.

Any system devised for a particular situation must suit the management style and capabilities of that company. Other basic factors that must be taken into account are the company's size, its organization, its products, its processes, and its current needs.

Hence, the thrust of this Manual is to present concepts and options that can best add to the "cost understanding" of the management personnel of the smaller companies. By providing choices and a broad perspective of the subject, management of the smaller companies can get direction for dealing with present circumstances, and at the same time be aware of more effective alternatives that can reasonably be considered in the future, when and if the company grows in size and/or aims at greater effectiveness in its management control.

A main objective of this presentation was to go beyond the 1975 Cost Manual of the WGMA in providing background information for smaller manufacturers.

That Manual provided brief descriptions of what should be included in typical accounts that might be used by a glove manufacturer. That information remains useable as a reference and has not been repeated here. At the same time, in certain details of that

Manual, other approaches are possible, and this Manual sets out to provide a broader view of the subject. Development of a chart of accounts for an individual company (for which the 1975 Manual provided some background information) depends on the type of system chosen, the degree of detail it seeks to achieve, its organization, its products, its processes, its factory locations, etc.

Adapting an existing chart of accounts to a new system is not especially difficult from an accounting point of view. What is often more significant to the development of a cost system than a new chart of accounts, are the kinds of information systems that are available in a particular company to provide data for the cost system: Labor Cost Analysis, Raw Material Inventory Control, Purchasing, Production Scheduling and Control, Finished Goods Inventory Control, etc. Many smaller companies should realistically give greater priority to improving the support systems, than to developing a cost accounting system with supposedly advanced features. For some of the more complex cost system approaches, sophisticated computer-oriented support systems are clearly indicated. For less advanced approaches, simpler systems without any use of a computer or with relatively limited use of a computer, are possible. It is often practical for a smaller company to gradually upgrade its systems in stages, rather than to take the risk of being overwhelmed by unexpected complexities. More advanced accounting in itself is not an ultimate objective; more effective management leading to greater profitability <u>is</u> an ultimate objective.

Relative to costs, the really fundamental goals of all work glove companies are the following:

1. To control cost to maximize profits

2. To accurately cost product as a guide to pricing and achieving satisfactory profit margins

3. To provide a basis for costing inventory for financial reports

The last objective was the primary reason for the original development of cost accounting as a specialized field. In its early days, cost accounting simply meant accounting for the inventory costs that are required for balance sheets and income statements. Cost accounting was at that time a specialized adjunct to financial accounting in manufacturing situations.

In the past twenty-five years, however, the meaning of cost accounting has significantly broadened to include accounting for all types of costs and information that facilitate management control of operations. The latter has been termed by some as management accounting or cost management and this field has grown rapidly in importance because it provides management with the information required to plan and monitor all of its costs in a timely way. By use of the special techniques of modern cost management, a company can achieve greater profitability and control than it otherwise would be able to attain.

In this Manual, one of the two primary subjects is product costing and this particular function is essential both to the inventory evaluation aspect of cost accounting and to the cost management aspect of cost accounting. The second primary subject of this Manual is cost management (cost control) which involves monitoring and influencing actual costs relative to planned costs.

One of the characteristics of the Work Glove Industry is the wide range in size of the individual firms, whether measured by annual sales volume or number of employees. As of August, 1980, of 23 firms who provided information for a Diagnostic Study noted in the footnote below*, 6 firms (26%) had sales of less than 3.0 million, 10 firms (43%) had sales between 3.0 and 10.0 million, and 7 firms (30%) had over 10.0 million in sales. Firms in the smallest volume group had less than 100 employees, firms in the mid-volume range generally had between 100 and 249 employees, and the large firms typically employed 500 or more.

(*) See "A Diagnostic Study of the Work Glove Industry" by Economic Consulting Services Inc., Washington, D.C. - August 1980.

Given the wide range of company size, it is reasonable to assume that the level of sophistication of the cost accounting procedures that exist in the Industry varies widely. This is indirectly indicated by the Diagnostic Study previously mentioned. The firms surveyed were

asked if they had a cost accounting system, and all but two of the 20 firms responded that they had a cost accounting system, and these two firms were in the less than 3.0 million group. Of the 20 firms that stated that they had a cost accounting system, 17 of the firms stated that their systems could be improved. No attempt was made in that study to develop data as to the kind or quality or specific characteristics of each cost accounting system, but nearly all of the firms were apparently conscious of some system inadequacy.

The gamut of sophistication of cost accounting systems is so wide that it could range from one firm whose most advanced aspect of cost accounting is to have very approximate product costing (for finished goods inventory evaluation) to another firm that

(1) practices comprehensive budgetary control together with a complete ledger-controlled standard cost accounting system aimed at analyzing a large variety of significant variances on a very timely basis,

(2) does product costing using both full absorption costing and variable costing, using the data for various types of management analyses.

One of the complexities that the Work Glove Industry has in common with many other industries is a large variety of product. This fact has often been the chief motivation in getting firms to improve their product costing techniques especially in an industry where price competition has traditionally been strong. This situation has been exacerbated in recent years by the competition from imported products.

A reasonably accurate cost estimate or projection for each product is essential under such conditions. Without such data as a guide for pricing, an unfavorable product mix could have serious consequences, even when the overall volume would appear to be adequate.

It is the smaller companies of the industry who have had less access to the best and most modern ideas in the field of costs for a number of reasons including:

(a) limited resources in time, money and management personnel to undertake new management systems

(b) lack of sophistication and experience on the part of the chief executive relative to the benefits of such techniques.

Similarly, the larger companies of the industry are more likely to be using more advanced cost accounting and cost management techniques for a number of reasons including the following:

(a) sufficient resources in time, money and management personnel to undertake new managment systems

(b) with a larger management staff, greater likelihood of having executives who have been exposed to advanced cost management techniques via experience or training

(c) more complex operations and organizations require more elaborate techniques of control.

The above is not meant to imply that all companies should have equally advanced systems; the reverse is true. As a company increases in physical size, number of product groups, number of plants, organizational size, organizational levels, etc., more elaborate cost management systems are both required and cost justified. Smaller companies have the potential for effective operation with cost management techniques that are not only smaller in scale but simpler in concept. As a company grows and its operating conditions change, the use of more advanced cost managment techniques should be considered. However, the operational cost of such techniques must always be justified by the benefits that can reasonably be expected. The field of cost accounting and cost management is one where both excessive complexity and excessive simplicity are frequently encountered.

Although this Manual emphasizes systems and techniques, it is nevertheless worth noting that cost control effectiveness is often more dependent on management diligence and cost awareness, than on the exact level of sophistication of its cost accounting system and its cost reports.

Obviously, the optimum situation is an energetic, competent management that makes effective use of a sound cost accounting approach and cost control reports, all based on reliable standards and budgets. However, smaller companies do not necessarily require or benefit from what may be regarded as the ultimate: an advanced, ledger-controlled standard cost accounting system with comprehensive budgetary control and a very detailed breakdown of costs. Many smaller companies can function very effectively without all of the trappings of larger enterprises.

The smaller companies should focus on fundamental needs for successful operation:

o To have reliable product costing, each company should have reliable (and optimum) direct labor standards, reliable (and optimum) direct material standards, a reliable mechanism to estimate the labor and material costs in excess of the standards so that total labor and material costs for each product can be estimated, and budgets which are necessary for predetermining overhead costs including manufacturing, selling, administrative and distribution.

o To have reliable cost control, each company must have all of the items already mentioned for product costing. In addition, there must be reports that make it possible to monitor all significant costs (in a sufficiently timely way to permit management to take effective action). Such reports should include analysis of the following:

Direct labor variances

Direct material variances

Manufacturing overhead variances

Operating overhead variances (selling, administrative, distribution)

Sales variances

The above can in many cases be substantially achieved without a ledger-controlled system and without a formal budgetary control system. Direct labor variances can be controlled by properly designed weekly labor cost analysis; Direct material variances can be substantially controlled through Gain and Loss Reports plus Reports on special materials issues for repairs, defective material, etc. Frequently it is not necessary to use all of the overhead variance components that are available. (See Section D.)

The guiding principle should be to use the simplest procedures (system) that will substantially achieve the above objectives.

This Manual will mention alternatives and concepts, that are applicable to both small and large companies, but the requirements of smaller companies will be emphasized. Furthermore, well managed smaller companies have a habit of growing into larger companies, and there should be an awareness that cost management systems must be revised to accommodate changed circumstances.

Many thick volumes on cost accounting are available that provide detailed description of both the general and the more specialized aspects of the subject. This Manual does not aim to be a substitute for such texts but does aim to focus attention on elements that are most relevant to the smaller and growing manufacturers.

The Manual is divided into four Sections:

A. Introduction

B. Overview

C. Product Costing

D. Cost Management

The following individuals and others were helpful in various ways in the preparation of this Manual.

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Jack B. Kaplan	- President, J.B. Kaplan & Company, Inc.

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B. OVERVIEW OF COSTING AND COSTS

B.1 Fundamental Concepts and Definitions

In product costing and cost management certain basic concepts and definitions underlie the broader aspects of the subject. For some who read this Manual many of these items are fairly commonplace, but for others brief mention here will be useful. Some of the concepts mentioned below are defined and discussed more fully later in the text.

The total cost for manufacturing a product generally falls into three broad categories:

Direct Labor

Direct Material

Manufacturing Overhead

Direct Labor and Direct Material are the labor costs and the materials costs that are physically traceable to the product, are measurable and are sufficiently significant to be worth measuring.

Manufacturing labor and materials which are not Direct are classified as Indirect.

Indirect Labor will normally be included in Manufacturing Overhead. (However, as explained in Section C2.2, some departmental indirect may be connected to Direct Labor as both a practical and logical matter.)

Indirect Material used in manufacturing is classified in Manufacturing Overhead. (Note, however, that one company may classify thread or a shipping carton as a Direct Material; another company might classify such items as Indirect Material and then these costs become part of Overhead.)

Manufacturing Overhead Costs are, in essence, the indirect costs of manufacturing. They include indirect labor, indirect material and other indirect costs such as rent, heat, insurance, depreciation, etc.

Product Cost or the Manufacturing Cost of a Product is the sum of Direct Material and Direct Labor and Manufacturing Overhead.

There are two relatively common types of Product Cost:

(1) Full absorption product cost

(2) Variable manufacturing product cost

B. OVERVIEW OF COSTING AND COSTS

B.1 Fundamental Concepts and Definitions

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There are two relatively common types of Product Cost:

(1) Full absorption product cost

(2) Variable manufacturing product cost

Everyone is familiar with full absorption product cost, even if the term "full absorption" is not familiar. This product cost is simply the sum of Direct Material and Direct Labor and all of the Manufacturing Overhead - Fixed and Variable. Full absorption means full absorption of overhead.

Before describing a Variable Product Cost, the following brief definitions will be helpful:

Fixed and Variable are normally used only in connection with Overhead, because Direct Labor and Direct Material, are by definition fully Variable. (In some contexts "Direct" can be taken to mean "Variable").

A Fixed Overhead Cost is one that remains constant as production levels vary within a given range. (Example: taxes, depreciation, etc.)

A Variable Overhead Cost is one that varies in direct proportion to the production level, i.e. 10% more production, 10% more cost, etc. (Example: factory supplies, power for production machinery, etc.)

Most overhead costs (but not all) are not fully fixed or fully variable, by the above definitions. Simplifying assumptions are practical where the net inaccuracy is not significant. However, some overhead costs are best classified by dividing the total cost into a Fixed and Variable component.

In summary, total Fixed Cost is a constant amount; total Variable Cost will depend on how much product is made.

Variable Manufacturing Cost is the sum of Direct Labor and Direct Material and Variable Manufacturing Overhead.

The Total Cost for a manufacturing company consists of Product Cost (or Manufacturing Cost of a product) plus other overhead costs sometimes referred to as Operating Expenses or Period Costs.

These Operating Expenses can be classified into broad categories, such as:

Distribution (Warehousing/Shipping)

Selling

Administrative (General and Administrative)

Product Development (Research, etc.)

All companies will not use all of the above categories. Selling and Administrative are the most commonly used categories, but it is possible to have a company where Selling is not a significant cost. All companies have some Distribution cost, but in some it may be so small that it is included in Selling or even Manufacturing. Although most companies have Product Development or design costs, it may be so small that it is included in one of the other categories.

Each of the Operating expenses can be classified as Fixed or Variable or a portion to each.

For the purpose of managerial analyses involving costs, volume and profit, some companies use a costing technique known as Direct Costing or Variable Costing in addition to Full Absorption Costing. In a Direct Costing situation, all variable costs associated with a product are separated from all fixed costs. (All variable costs means Direct Labor, Direct Material, Variable Mfg Overhead and all Variable Operating Expenses.)

With a full absorption costing approach, the difference between the Selling Price and the Manufacturing Cost of a product, is the Gross Margin or the Gross Profit for that product.

With a variable costing approach, the difference between the Selling Price and the Total Variable Cost associated with a product, is the Contribution Margin for that product.

Some companies have little interest in or are unfamiliar with Variable Costing; others find it very useful for internal analysis. Full absorption costing must be used for inventories that appear on financial statements that are used outside the company.

The Total Variable Cost of a product represents the total "out-of-pocket" cost of that product. As long as the Selling Price is above that Total Variable Cost, sale of that product is making some contribution toward the recovery of Fixed Costs and ultimately Profit.

In terms of the way in which costs are accumulated in a Cost Accounting system, there are two major approaches, to which reference is frequently made: Job Order Costing and Process Costing. Job Order Costing is used where individual jobs, representing individual orders, are costed. A simple example would be auto repair jobs for individual customers at an automobile dealer's service facility or a public accounting firm. Process Costing is where there is a continuous flow of a standard product or products. A simple example would be a branded chocolate bar or soap or chemical processing.

These two terms, Job Order Costing and Process Costing, do not, in fact, represent the only two categories into which systems can fall. They only represent two extremes -- two ends of a spectrum of possibilities.

The significant points to know about these two terms are the following: Job Order Costing involves the accumulation of costs on a Job Sheet or Job Record. Process Costing involves the accumulation of costs, usually on a Departmental record (or alternatively, a Process, or a Work Center, or Operation or Product record). Job costs are the costs for a specific job. Process costs are average costs over a period of time covering more than one job or lot.

Process costs are typically easier to accumulate than Job costs and should be favored, unless there is an overriding reason to accumulate by the job. This is the principle that ought to be followed in the work glove industry, where a practical combination of Job and Process ought logically to be used, to get the best cost data at the lowest cost.

Overall, the terms of Job Order and Process systems are used very commonly, and are therefore mentioned here, but in the work glove industry, these terms have less value than an explicit description of each individual situation.

B2. Standard and Budgeted Costs

One of the central points to be made in this Manual for smaller manufacturers is that the foundation for effective product costing and cost management (cost control) is the proper use of standard costs and budgets. This fundamental fact applies to large companies as well as small companies, but it is the smaller company where these elements are often neglected.

It often happens that in a small company (especially one still headed by the original individual entrepreneur or his immediate successor) that the words "standards" and "budgets" conjure up visions of detailed and sophisticated cost accounting systems supported by an Engineering and Cost Department staff. Although this vision is often true for the relatively large company, it need not necessarily be true for the smaller company.

Ideally, each work glove company ought to have an engineering/cost function as part of its operation, if it is to be able to reliably determine its costs when changes in product take place. Nevertheless, there are glove manufacturers where the product mix falls within a limited range and relatively few completely new material and labor standards are required over a period of time. For such situations, it may be possible to maintain standards as a part-time function on someone's part. (Obviously, a work glove company will tend to reach a more optimum manufacturing size when its output is able to comfortably support a full-time, specialized engineering/cost function.)

It is a solid axiom of good business management that labor operations and materials required in a product should be covered to a maximum degree by reliable standards. For direct labor operations, when reliable standards are available, they are typically used as the basis for incentive payments. However, when feasible, for direct operations not on incentive, standards ought also to be developed. For direct materials, standards based on measurement for each size or the average size are a necessity.

Thus, a logical first step for the small manufacturer who wishes to strengthen his cost management ability, is to increase his standard coverage for material and labor requirements for each product. Further, such standards ought to be determined in a consistent and accurate way, and should be based on methods and patterns that minimize labor and material costs.

Considering the basic importance of standard and budgeted costs, further explanation of these two elements is warranted.

Standard and budgeted costs are costs which are determined in advance of their occurrence, and represent, in effect, the costs that management ultimately seeks or plans to achieve during a current accounting period. It is usual for these costs to be based on efficient operating conditions that are attainable.

A so-called Standard Cost Accounting System makes use of standard and budgeted costs, but it is possible and very useful to use standard and budgeted costs even without having a full Standard Cost Accounting System (one that is integrated with the General Ledger). This last distinction is especially important for smaller work glove manufacturers who may not want or be prepared to handle a full Standard Cost Accounting System, but who need to use standard and budgeted costs for effective management and cost control, and for effective product costing and pricing.

Occasionally there is looseness or confusion in the use of the two terms: standard costs and budgeted costs. It is helpful to remember that the two terms share more in common than in difference, and can often be interchanged without any loss of meaning. However, the most common distinctions between the two terms in everyday practice are the following:

Standard Costs typically imply costs that are based on reasonably accurate measurement ("standards"), and from the measurement point of view standard costs are most logically associated with labor and material, where direct measurement is feasible and in common use. However, it is very usual to refer to all of the cost elements on a Product Cost Sheet as "standard costs" even when some of these costs have been largely derived from budgets. Sometimes, too, budgeted/estimated costs in a Standard Cost Accounting System are either referred to as standard or budgeted costs.

Budgeted Costs typically imply estimated or planned costs and are most usually asociated with overhead where estimates or budgets are used. Regardless of how carefully such budget costs are determined, they cannot normally make use of any direct physical measurement, as is the case with labor and material.

It has already been mentioned above that some so-called standard costs that appear on a Product Cost Sheet are really not "measured" costs. (e.g. factory overhead, selling overhead, etc.) To this must be added the fact that even with a Standard Direct Labor Cost or a Standard Direct Material Cost on a product cost sheet, such costs in most instances are not totally based on direct physical measurement. Frequently, these so-called standard costs have both a measured component and a planned/budgeted/estimated component.

Example A

Std Lab Cost = Meas or Incen Labor Cost X Std or Budg Cost Ratio,

where, "Std Lab Cost" is the Standard Labor Cost for an operation or process on a particular work glove product

"Meas or Incen Labor Cost" is the measured cost or the incentive payment for that operation or process

"Std or Budg Cost Ratio" is the standard or budgeted cost ratio which will increase the measured cost by an estimated amount that will cover the extra costs of labor such as training, repairs,loss for below-standard performance (make-up), the loss for other abnormal conditions, overtime premium, repairs, etc.

These extra costs are sometimes termed the labor inefficiency costs. A common and often useful variant of such a Cost Ratio is to include some departmental indirect labor - at least that portion which tends to increase or decrease as the volume level of the department or plant tends to increase or decrease.

Example B

Std Mat Cost = Meas Mat Cost x Std Mat Adjustment Ratio

where, "Std Mat Cost" is the Standard Material Cost for a particular work glove product

"Meas Mat Cost" is the measured material cost for a particular product. Typically, it is based on the material allowance used to calculate the quantity of material to be issued for the first production operation. It will include the expected normal waste of the first production operation (e.g. cutting or knitting), but will typically not include any other waste or shrinkage factors.

"Std Mat Adjustment Ratio" is the standard material adjustment ratio which will increase the measured material cost by an amount that will cover the extra material costs of recuts, repairs, abnormally bad material and other shrinkage (assuming that it is decided to reflect these extra costs as part of Standard Material Cost and not elsewhere.)

Although the standard ratios referred to above are determined by review and analysis of past experience and anticipated experience, direct physical measurement is not a significant factor in the ratio itself.

For effective management control of costs and operations, standard costs/budgeted costs have major advantage for obvious reasons. Actual costs have little significance in absolute terms until they can be compared with the costs that should have occurred (standard/budgeted costs). The differences (variances) will either be favorable or unfavorable and will provide guides to management action. By dealing only with significant variances, management is able to make effective use of the time-proved principle of managment by exceptions.

The management technique known as variance analysis and control can and should be utilized by companies of all sizes. One feature of this approach is that it is not an all or nothing approach, i.e. it can be used in a limited way, in a comprehensive way or anywhere in between. Even smaller companies with relatively limited staff can and should use this technique for many or all of the significant elements of cost. Again it should be stressed that although this technique is an integral part of a full Standard Cost Accounting System, the technique can be used even when a Standard Cost Accounting System, which implies maintaining variance accounts in the General Ledger, is not used. This is a key point to be recognized by smaller companies.

For effective product costing (which in turn provides a sound basis for effective pricing) standard and budgeted costs are a necessity, since product costing for pricing must typically be done in advance of manufacturing.

Wherever Overhead costs must be costed into a product, a budget of such costs must be determined, so that a "Predetermined Overhead Costing Rate" can be developed. This applies to Manufacturing Overhead, Distribution Overhead, Selling Overhead, etc. (Further, to develop such Overhead Costing rates, it also is necessary to develop a Sales Budget, which is normally the responsibility of the Sales Manager.) When all costs and sales have been budgeted, and each part is consistent with every other part, a Master Budget has in effect been created. A complete Master Budget normally includes an Income Statement, a Balance Sheet and a Cash Flow Statement.

Included in this Manual are Worksheets that can be used as a guide for the development of budgets.

The process of developing a budget can vary from a detailed, analytical, zero-base budgeting approach to a relatively fast overall estimate based on the most recent actual figures and a rough evaluation of future influences on each cost. Obviously, the more effort put into the budgeting process, the more reliable will it be and the more will it provide additional insights for management. However, aside from the desired quality level of the budget, the essential requirement is that reasonable budgets are made, regardless of the size of the company.

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C. PRODUCT COSTING

C1. An Overview - Use of Product Cost Sheets

In order to explain the steps for calculating a total cost for a particular product, and in order to explain some of the more common alternative approaches, an illustrative Cost Sheet Form in two versions is utilized here.

One of these Product Cost Sheet forms is more elaborate, has more detail, and provides for both full absorption and variable costing. (Exhibit 2)

The other form, which is the simpler version, uses only full absorption costing with some of the details of the first form left off. (Exhibit 1)

Two additional Product Cost Sheet forms (Exhibits 2A and 1A) are included here, which are identical to Exhibits 2 and 1, except that the so-called Cost Ratio applied to Direct Labor in the Direct Labor section of Exhibits 2 and 1 is omitted. Exhibits 2A and 1A provide a format for labor and manufacturing overhead which is supposed to be more in line with current practice in the Work Glove Industry. Both approaches are useable. The difference between the two approaches is discussed later in this section.

These two forms are used here to facilitate explanation. A standard or universal Product Cost form is neither feasibile nor desirable. Not only does each company have its own special requirements because of the kind of data, the kind of products, and the kind of cost calculations that it chooses to use or needs to use, but in addition individual preferences and styles of each management should logically be reflected.

Assuming that a particular company is considering improvement of its existing Cost Sheet, that company might find it convenient to temporarily use one of the forms included here, until it has decided all of the details of a permanent form. One company, for example, might find it convenient to have one complete and compact sheet, such as the forms used here. Another company, might find it more convenient to put all product and materials description on one sheet, put all labor costs and summary cost calculations on another sheet, and have each of the two sheets face each other in a 3-ring binder. Sometimes such an arrangement depends on who supplies the material specs and who provides the labor specs. Other considerations: How much room does one find comfortable in recording material specs? Does the company wish to have revision columns on the same sheets, or will having another new sheet be more convenient? Are preliminary or estimated costs regularly used in addition to Standard costs, and is it more convenient for the company that all of these costs appear on one sheet? - etc.

The attached forms are thus simply being used to provide a convenient basis for explaining various approaches and principles for effectively calculating Product Costs.

(For those who may find it more convenient to have a separate Materials Specification Sheet, two forms have been included here: one for simpler fabric type gloves, (Exhibit 5) and another for leather gloves, which often have more detail and more parts (Exhibit 6). For some work glove manufacturers an even larger Spec sheet might be necessary [either two sided 8 1/2" x 11" or one side 8 1/2" x 14"])

This section will deal with the overall use of a Product Cost Sheet, and some basic variations and principles. The sections that follow will deal with the determination of labor, material, and overhead costs for use on a Product Cost Sheet.

Exhibit 1 and Exhibit 2 show the Product Cost Sheet forms without any entries.

Exhibit 3 and Exhibit 4 show the same Product Cost Sheet forms with illustrative entries and calculations.

Exhibits 1A, 2A, 3A, and 4A are identical to the Exhibits above except that the so-called Direct Labor Cost Ratio is omitted, and the Manufacturing Overhead Rates have been adjusted to reflect the costs included in the Cost Ratio. See Section C1.4 for further explanation.

Exhibit 1

COST SHEET ILLUSTRATIVE FORMAT SIMPLIFIED VERSION	☐ COST ESTIMATE STANDARD COST ☐	PRODUCT GROUP	STYLE NO.
DESCRIPTION:	PATTERN	REPLACES STYLE NO.	SPEC NO
	LINING	SPEC NO	DATE
MADE SPECIAL FOR	APPROVED BY	DATE	PREP BY

● PRODUCT SPECS

PART	DIE NO	WT (OZ)	MAT'L NO.
PALM			
THUMB			
FINGERS			
BACK			

WRIST TYPE — CUT SIZE: — FIN SIZE:

CUFFING

OPERATION	
NEEDLE THREAD	
LOOPER THREAD	
SEAM WIDTH	
STITCHES PER IN	

ELASTIC

BINDING

CARTON NO. — Q/CARTON — STAPLE TICKET

CASE NO. — TAG — POLYBAG

● DIRECT MATERIALS

DESCRIPTION	MAT'L NO.	ALLOWANCE	UM	PRICE		AMOUNT
		TOTAL DIR M COST BEFORE %	WASTE, RECUT %	TOTAL DIRECT MAT'L →		

● DIRECT COSTS – MISC

OUTSIDE CONTRACTING

● DIRECT LABOR

OPERATION / PROCESS	AMOUNT

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TOTAL DIRECT LABOR = COST RATIO × TOTAL LABOR COST	COST RATIO	TOTAL LABOR COST	TOTAL DIRECT LABOR →	

● MANUFACTURING OVERHEAD (AND ADJUSTMENTS TO MFG COST)

TOTAL FACTORY OVERHEAD = TOTAL DIRECT LABOR × OVERHEAD %	OVERHEAD %	TOTAL MFG OVHD COST →	
TOTAL MANUFACTURING COST BEFORE ADJUSTMENTS			
ADJUSTMENT FOR INVENTORY SHRINKAGE, SUB-STANDARD PRODUCT			

●

TOTAL MANUFACTURING COST		
DISTRIB, SELLING, ADMIN		
PROFIT		

		TOTAL DIR M COST BEFORE %	WASTE, RECUT %	TOTAL DIRECT MAT'L →		

● DIRECT COSTS - MISC

OUTSIDE CONTRACTING	→

● DIRECT LABOR

OPERATION / PROCESS	AMOUNT

Reproduced from best available copy.

TOTAL DIRECT LABOR = COST RATIO × TOTAL LABOR COST	COST RATIO	TOTAL LABOR COST	TOTAL DIRECT LABOR →	

● MANUFACTURING OVERHEAD (AND ADJUSTMENTS TO MFG COST)

TOTAL FACTORY OVERHEAD = TOTAL DIRECT LABOR × OVERHEAD %	OVERHEAD %	TOTAL MFG OVHD COST →	
TOTAL MANUFACTURING COST BEFORE ADJUSTMENTS			
ADJUSTMENT FOR INVENTORY SHRINKAGE, SUB-STANDARD PRODUCT			

●

	TOTAL MANUFACTURING COST	
	DISTRIB, SELLING, ADMIN	
	PROFIT	
	TOTAL COST (TO MAKE AND SELL)	
	CALCULATED SP	
	ACTUAL SP	
	ACTUAL GROSS MARGIN - %	

Exhibit 2

COST SHEET — ILLUSTRATIVE FORMAT MODIFY TO SUIT INDIVIDUAL REQUIREMENTS	☐ COST ESTIMATE / STANDARD COST ☐	PRODUCT GROUP	STYLE NO.
DESCRIPTION:	PATTERN	REPLACES STYLE NO.	SPEC NO.
	LINING	SPEC NO	DATE
MADE SPECIAL FOR	APPROVED BY	DATE	PREP BY

● PRODUCT SPECS

PART	DIE NO.	WT (oz)	MAT'L NO.	WRIST TYPE	CUT SIZE:	FIN SIZE:
PALM				CUFFING		
THUMB						
FINGERS				OPERATION		
				NEEDLE THREAD		
BACK				LOOPER THREAD		
				SEAM WIDTH		
				STITCHES PER IN		
ELASTIC						
BINDING						
CARTON No.		Q/CARTON		STAPLE TICKET		
CASE No.				TAG		POLYBAG

● DIRECT MATERIALS

DESCRIPTION	MAT'L NO	ALLOWANCE	UM	PRICE	WASTE %		AMOUNT
						TOTAL DIRECT MAT'L →	

● DIRECT COSTS - MISC

OUTSIDE CONTRACTING →	

● DIRECT LABOR

OPERATION/PROCESS	COST CENTER OR PLANT				
COST RATIO CALCULATION: TOTAL BEFORE LR					
COST RATIO					
DIRECT LABOR TOTALS BY COST CENTER					TOTAL DIRECT LABOR →

Reproduced from best available copy.

● MANUFACTURING OVERHEAD (AND ADJUSTMENTS TO MFG COST)

MFG OVERHEAD - V	%					TOTAL MFG OVHD - V →
	AMT					
TOTAL VARIABLE MANUFACTURING COST (BEFORE ADJUSTMENTS) :						
MFG OVERHEAD - F_B	%					TOTAL MFG OVHD - F_B →
	AMT					
MFG OVERHEAD - F_C	%					← TOTAL MFG OVHD - F_C
	AMT					
TOTAL MANUFACTURING COST BEFORE ADJUSTMENTS						
ADJUSTMENT FOR INVENTORY SHRINKAGE, SUB-STANDARD PRODUCT - V						

● COST SUMMARY

						TOTAL DIRECT MAT'L →	

● DIRECT COSTS - MISC

OUTSIDE CONTRACTING

● DIRECT LABOR → |

OPERATION/PROCESS		COST CENTERS OR PLANT				
COST RATIO CALCULATION	TOTAL BEFORE CR					
	COST RATIO					
DIRECT LABOR TOTALS BY COST CENTER						TOTAL DIRECT LABOR →

Reproduced from best available copy.

● MANUFACTURING OVERHEAD (AND ADJUSTMENTS TO MFG COST)

MFG OVERHEAD - V	%					TOTAL MFG OVHD - V →	
	AMT						
TOTAL VARIABLE MANUFACTURING COST (BEFORE ADJUSTMENTS)							
MFG OVERHEAD - F_B	%					TOTAL MFG OVHD - F_B →	
	AMT						
MFG OVERHEAD - F_C	%						← TOTAL MFG OVHD - F_C
	AMT						
TOTAL MANUFACTURING COST BEFORE ADJUSTMENTS							
ADJUSTMENT FOR INVENTORY SHRINKAGE, SUB-STANDARD PRODUCT - V							

● COST SUMMARIES

CONTRIBUTION COST SUMMARY	
DIRECT MATERIAL	
DIRECT COST - MISC	
DIRECT LABOR	
MFG OVHD - V	
ADJUST TO MFG COST	
TOTAL MANUF COST - V	
DISTRIBUTION - V	
SELLING - V	
ADMINIS - V	
TOTAL VARIABLE COST	
PLANNED CONTRIB - % OF TVC	
CALC SP	
ACTUAL SP	
ACTUAL CONTRIB - % OF TVC	

GROSS MARGIN COST SUMMARY			C	B	CONTING. VOLUME	BUDGET VOLUME
TOTAL MFG COST (INCL F+V MFG OVHD)						
DISTRIB	%	V				
		F				
SELLING	%	V				
		F				
ADMINIS	%	V				
		F				
PROFIT	%	V				
TOTAL COST (TO MAKE AND SELL)						
CALC SP						
ACTUAL SP						
ACTUAL GROSS MARGIN - %						
ACTUAL NET PROFIT MARGIN - %						

Exhibit 3

COST SHEET — ILLUSTRATIVE FORMAT SIMPLIFIED VERSION	☑ COST ESTIMATE / STANDARD COST ☐	PRODUCT GROUP	STYLE NO.
DESCRIPTION: Every Use Gloves	PATTERN Clute	Super Strong	1234
	LINING	REPLACES STYLE NO.	SPEC NO SS-425
MADE SPECIAL FOR Z-Mart	APPROVED BY JB	SPEC NO	DATE 9-10-82
		DATE	PREP BY WE

● PRODUCT SPECS

PART	DIE NO	WT (OZ)	MAT'L NO.
PALM	G56	3oz	L8623
THUMB	G83	8oz	F1286
FINGERS	G83	8oz	F1286
BACK			

WRIST TYPE — CUT SIZE: — FIN SIZE:

CUFFING

OPERATION	Close
NEEDLE THREAD	30-3
LOOPER THREAD	60-2
SEAM WIDTH	1/8"
STITCHES PER IN	10

ELASTIC

BINDING

CARTON NO. B4200 Q/CARTON 12 STAPLE TICKET

CASE NO. C7722 TAG POLYBAG

● DIRECT MATERIALS

DESCRIPTION	MAT'L NO.	ALLOWANCE	UM	PRICE		AMOUNT
Leather - Splits	L8633	8.163	Ft	.50	108/98	4.320
Verituff	F1286	2.350	Lyds.	1.00		2.350
Thread-est						.200
Misc.-incl Tickets, Labels, etc.	Misc-1		Doz	.15		.150
1 Doz Carton	B4200	1	ea.	.10		.100
6 Doz Case	C7722	1/6	ea.	.90		.150
		TOTAL DIR M COST BEFORE % 7.270	WASTE, RECUT % 1.0%	TOTAL DIRECT MAT'L →		7.343

● DIRECT COSTS - MISC

OUTSIDE CONTRACTING →

● DIRECT LABOR

OPERATION / PROCESS	AMOUNT
Incentive	
Operations A Cut	.252
B Stitch 1	1.135
C Stitch 2	.425
D Stitch 3	.0844
E Foam	.415
Direct TW:	
Operation F Pack	.208

TOTAL DIRECT LABOR = COST RATIO × TOTAL LABOR COST	COST RATIO	TOTAL LABOR COST	TOTAL DIRECT LABOR →
	1.290	2.5194	3.250

● MANUFACTURING OVERHEAD (AND ADJUSTMENTS TO MFG COST)

TOTAL FACTORY OVERHEAD = TOTAL DIRECT LABOR × OVERHEAD %	OVERHEAD % 60%	TOTAL MFG OVHD COST →	1.950
TOTAL MANUFACTURING COST BEFORE ADJUSTMENTS			12.543
ADJUSTMENT FOR INVENTORY SHRINKAGE, SUB-STANDARD PRODUCT	1%		.125

●

Note: Specs, Quantities Costs, and Rates Shown have no Significance

Purpose of Entries is to illustrate Calculations and arrangements of cost sheet data

TOTAL MANUFACTURING COST		12.668
DISTRIB, SELLING, ADMIN	33.3%	4.218
PROFIT	11.6%	1.469
TOTAL COST (TO MAKE AND SELL)		16.886
CALCULATED SP		18.355
ACTUAL SP		19.000
ACTUAL GROSS MARGIN - %		33.3%

Exhibit 4

COST SHEET (ILLUSTRATIVE FORMAT MODIFY TO SUIT INDIVIDUAL REQUIREMENTS)	☑ COST ESTIMATE / STANDARD COST ☐	PRODUCT GROUP: Super Strong	STYLE NO.: 1234
DESCRIPTION: Everyuse Gloves	PATTERN: Clute	REPLACES STYLE NO.: –	SPEC NO. SS 425
	LINING	SPEC NO SS-424	DATE 9-10-82
MADE SPECIAL FOR Z-Mart	APPROVED BY JB	DATE 12-15-81	PREP BY WG

● PRODUCT SPECS

PART	DIE NO.	WT (oz)	MAT'L NO.		
PALM	G56	3oz	L8623	WRIST TYPE	CUT SIZE: FIN SIZE:
THUMB	G83	8oz	F1286	CUFFING	
FINGERS	G83	8oz	F1286	OPERATION	Close
				NEEDLE THREAD	30-3
BACK				LOOPER THREAD	60-2
				SEAM WIDTH	1/8"
				STITCHES PER IN	10

ELASTIC

BINDING

CARTON No. B4200 Q/CARTON 12 STAPLE TICKET

CASE No. C7722 TAG POLYBAG

● DIRECT MATERIALS

DESCRIPTION	MAT'L NO	ALLOWANCE	UM	PRICE	WASTE %		AMOUNT
Leather - Splits	L8623	8.165	Ft	.50	1%	108/98	4.363
Veituff - Fabric	F1286	2.350	LYds	1.00	2%		2.397
Thread - Est					–		.200
Misc. incl. Tickets, Labels, etc	MISC-1		Doz	.15	1%		.152
1 Doz. Carton	B4200	1	ea	.10	1%		.101
6 Doz. Case	C7722	1/6	ea	.90	–		.150
						TOTAL DIRECT MAT'L →	7.363

● DIRECT COSTS - MISC

OUTSIDE CONTRACTING → –

● DIRECT LABOR

OPERATION/PROCESS	COST CENTERS OR PLANT CC-1	CC-2	CC-3	
Incentive: Oper A Cut	.252			
B Stitch 1		1.135		
C Stitch 2		.425		
D Stitch 3		.0844		
E Form			.415	
Direct TW: Oper F. Pack			.208	
COST RATIO CALCULATION: TOTAL BEFORE CR	.252	1.6444	.623	
COST RATIO	1.19	1.33	1.24	
DIRECT LABOR TOTALS BY COST CENTER	.300	2.187	.773	TOTAL DIRECT LABOR → 3.260

● MANUFACTURING OVERHEAD (AND ADJUSTMENTS TO MFG COST)

MFG OVERHEAD - V	%	25%	42%	30%		TOTAL MFG OVHD-V → 1.226
	AMT	.075	.919	.232		
TOTAL VARIABLE MANUFACTURING COST (BEFORE ADJUSTMENTS)						11.849
MFG OVERHEAD - F_B	%	22%	20%	28%		TOTAL MFG OVHD - F_B → .719
	AMT	.066	.437	.216		
MFG OVERHEAD - F_C	%					TOTAL MFG OVHD - F_C →
	AMT					
TOTAL MANUFACTURING COST BEFORE ADJUSTMENTS						12.568
ADJUSTMENT FOR INVENTORY SHRINKAGE, SUB-STANDARD PRODUCT - V					1%	.126

● COST SUMMARIES

CONTRIBUTION COST SUMMARY	
DIRECT MATERIAL	7.363
DIRECT COST - MISC	–
DIRECT LABOR	3.260
MFG OVHD - V	1.226
ADJUST TO MFG COST	.118
TOTAL MANUF COST - V	11.967
DISTRIBUTION - V	.919
SELLING - V	1.015
ADMINIS - V	–
TOTAL VARIABLE COST	13.901
PLANNED CONTRIB - % OF TVC	33.33%
CALC SP	18.534
ACTUAL SP	19.000
ACTUAL CONTRIB - % OF TVC	36.7%

GROSS MARGIN COST SUMMARY		C	B	CONTING. VOLUME	BUDGET VOLUME
TOTAL MFG COST (INCL F&V MFG OVHD)					12.694
DISTRIB %	V	7.24%			.919
	F	–	–		–
SELLING %	V	8.00%			1.015
	F		6.48%		.823
ADMINIS %	V	–			–
	F		11.58%		1.470
PROFIT %	V	11.6%			1.470
TOTAL COST (TO MAKE AND SELL)					
CALC SP					18.391
ACTUAL SP					19.000
ACTUAL GROSS MARGIN - %					33.2%
ACTUAL NET PROFIT MARGIN - %					

Exhibit 5

Production Specifications	Page of	Supersedes Style No.	Style No.
Product Type		Supersedes Spec No.	Spec No.
Stock No. Prep by Approved by		Old Issue Date	Issue Date
Style Description		Reason for New Spec	
		Made Special for	

Materials

Mat'l No.	Description	Wt.	Width	Cut Parts	Die No.	Sizes	Allowed Qty UM

Other Material Specs:

Wrist type: Cut Size: Finish Size:

Binding:

Elastic:

Thread Specs

Operation(s)	Mat'l No.	Needle Thread (Top) Size/Color	SPI	Mat'l No.	Looper Thread (Btm) Size/Color

Tickets/Labels/Bands

Mat'l No.	Description	Instructions

Printing/Stamping on Glove

Die No.	Position	Text or Symbol	Instructions	Ink(I)/Foil(F) Color

Packing and Shipping Materials:

Mat'l No.	Description	Instructions
	Carton No. Type:	xS - xM - xL - xXL
	Pack Prs/Carton	
	Case No. xxx	
	Pack Doz/Case	

Misc.

Exhibit 6

Product Specifications (Gloves with Leather Parts)	Page of	Supersedes Style No.	Style No.
Product Type		Supersedes Spec No.	Spec No.
Stock No. Prep by Approved by		Old Issue Date	Issue Date
Style Description		Reason for New Spec	
		Made Special for	

Leather Materials

Mat'l No.	Description	Wt.	Cut Parts	Die No.	Sizes	Allow	Ads/Grade	Allow

Non-Leather Materials

Mat'l No.	Description	Wt.	Width	Cut Parts	Die No.	Sizes	Allowed Qty	UM

Other Material Specs

Wrist Type: Cut Size: Finish Size:

Elastic

Binding

Thread Specs

Operation(s)	Mat'l No.	Needle Thread (Top) Size/Color	SPI	Mat'l No.	Looper Thread (Btm) Size/Color

Tickets/Labels/Bands

Mat'l No.	Description	Instructions

Printing/Stamping on Glove

Die No.	Position	Text or Symbol	Instructions	Ink(I)/Foil(F) Color

Packing and Shipping Materials:

Mat'l No.	Description	Instructions
	Carton No. Type:	xS - xM - xL - xXL
	Pack Prs/Carton	
	Case No.	
	Pack Doz/Case	

Misc.

C1.1 Simplified Version of Cost Sheet

The basic calculations on a cost sheet will be explained by first making reference to the simpler version of the Cost Sheet (Exhibits 1 and 3).

This Cost Sheet has 7 main parts:

1 - Header information

2 - Product specs

3 - Direct materials

4 - Direct costs - misc

5 - Direct labor

6 - Manufacturing overhead

7 - Cost Summary

The entries on this cost sheet are simply for the purpose of illustrating calculations and the arrangement of Cost Sheet data and do not represent any real product. No significance should be given to any of the quantities, costs, rates, specs, etc. The product costs would presumably be in dollars per dozen pairs of gloves. The work glove sketch does not relate to the fictitious product being "costed" on the Cost Sheet.

1 - Header Information

This section identifies the Product and includes: "Style No", "Spec No", "Date" and "Prepared by". As specifications change for a given product, for whatever reason, it is useful to have a Specification No. to uniquely identify each set of Specs. If there is insufficient room to record all key specs in the Product Spec section of the Cost Sheet, then a separate Spec sheet will be useful, and the Cost sheet can be modified accordingly.

"Replaces Style No" "Spec No", and "Date"
If this Cost Sheet is a revision of a previous Spec No., this information must be noted.

"Product Group" "Description", "Pattern", "Made Special For" and "Lining" are self explanatory.

"Approved by" is a means of having one more knowledgeable individual review Specs, Costs, etc.

"Cost Estimate" or "Standard Cost" should be checked. Standard Costs will be used where Variance Analysis reports are prepared.

2- Product Specs

This section supports the Direct Materials section. In these two sections together there must be enough information so that all material requirements and costs can be accurately listed.

Most of the captions in the Product Spec section of this form will be immediately recognizable by smaller work glove manufacturers. Uncaptioned items can be entered in the section wherever there is room. However, many manufacturers will require a more elaborate and larger Spec sheet and two examples of such sheets are Exhibits 5 and 6. Some manufacturers may prefer a Checklist type of Spec sheet where almost every common type of material is included. Many manufacturers have some very specialized specs for specialized products. In such cases more than one Product Spec form may be required.

The term "Material No." may require explanation for some smaller manufacturers. Material No. is a company's own unique identification number for each raw material, and is used in connection with electronic data processing systems. Sometimes it will be referred to as "Part No." (very common),

Code No., Mat No, Material ID, etc. Regardless of which term is used, it is a precise, concise, unique identification for each raw material, and it is required for efficient data processing for such functions as Raw Materials Inventory Control, Purchasing and Product Costing. For smaller manufacturers who do not yet use data processing, it can be left out. However, for those same manufacturers who are progressive and growth oriented, it would be foresighted to make provision for such identification numbers.

Die Numbers are key product specs because they define the pattern and the material requirement.

3 - Direct Materials

The first Cost section on the Cost Sheet is the cost of Direct Materials. Each material that has been classified as Direct for this product must be listed here and identified (Description and Material No.).

Indirect Materials will be reflected in Manufacturing Overhead (Factory Overhead, Factory Burden).

Based on accurate measurement, the amount of each material required (per dozen pairs of gloves) is recorded in the Allowance column (e.g. 2.350 Lineal Yards per doz pairs). The Price per Unit of Measure (UM) is recorded (e.g. $1.00 per Lineal Yard). Then the cost for that material is extended (e.g. $2.35 per dozen pairs). For leather an adjustment factor may be introduced into the calculation based on the grade of leather, and this is discussed in Section C2.1.

The total Direct Material Cost is then determined by adding together the cost of each material.

Materials waste incurred in an originating operation (e.g. cutting, knitting, dipping) should and is, as a matter of course, included in the basic allowance for that material. Every company should develop reliable data for the net yield in the originating operation.

However, there is a certain amount of waste of material after the originating operation. Adjustment for this type of waste can be done in more than one way, and the method chosen will depend on individual circumstances, including available data and convenience. (In Section C2. this is discussed further.)

One approximate but convenient way to reflect materials loss following the originating operation is to apply a "waste" percentage to the total Materials Cost and this is illustrated on the Cost Sheet.

4 - Direct Cost - Miscellaneous

The second Cost section on the Cost Sheet is Direct Costs - Misc. and this is used infrequently, but it is shown here separately, because it is a separate type of cost. It covers the situation where the services of an outside contractor are purchased for a specialized operation, presumably one that is not done in the factory. Sometimes such a cost is called a Direct Expense. (This is a questionable use of the term "expense" which for most accountants has a more limited meaning.) This cost section is for those relatively rare instances where there is a truly direct cost which is neither labor nor material.

5 - Direct Labor

In the third cost section which is for direct labor, each direct operation must be listed. Since most work glove operations use incentive plans, typically the incentive-payment $-per-dozen-pair cost for each operation is recorded. This cost is sometimes known as the Incentive cost, or the Incentive Standard cost, or the Measured cost. These Incentive Standard costs might be derived from a piece-rate plan or a Standard-Hour plan or a Standard Minute plan or some other type of incentive plan. (Note: With a Standard Hour incentive plan, the Incentive Standard cost in $ per dozen pairs is equal to the Standard Hours per dozen pairs multiplied by the Standard $ per hour for that operation. Similarly for Standard Minutes.)

When these Incentive Standard costs are totaled (in this case, one total for the factory as a whole), they must be increased by a percentage to cover all of the labor costs other than the measured labor costs (e.g. overtime premium, make-up, allowances, etc.). This percentage brings the Incentive Standard cost up to the Total Standard Cost for Direct Labor. Thus, in Exhibit 3, the total Labor Cost of 2.5194 (which is the total Incentive Standard labor cost) is multiplied by a Cost Ratio of 1.290. The result is the Total

Standard Direct Labor cost ($3.250 per dozen pairs). In developing the Cost Ratio, proper account must be taken of direct labor done on a time work basis and departmental indirect labor, typically done on a time work basis also. These aspects of the calculation are discussed in Section C2.

It may be useful to point out here that this product cost example (Exhibit 3) represents a relatively simple approach, that will often serve the purposes of the smaller manufacturer. Here, a single plant-wide Labor Cost Ratio is assumed to be satisfactory (rather than separate Cost Ratios for each department). Similarly, manufacturing overhead will be applied to a single plant-wide total of Direct Labor (rather than having more than one overhead rate for different cost centers.)

6 - Manufacturing Overhead

In this example, it is assumed that Manufacturing overhead is applied as a percentage of the total Direct Labor cost. This is a simple, common and very often sound approach. It is, however, not the only possible approach, and there is further discussion of this matter in Section C3. Also, it is assumed in this situation that a single, plant-wide Manufacturing

Overhead rate is satisfactory, and this too will often prove to be a sound approach, especially in smaller companies where there is only one factory and the departmental flow of all products is essentially similar.

Thus, in this example, the Total Direct Labor ($3.250 per dozen pairs) is multiplied by 60% to give a Total Manufacturing Overhead Cost of $1.950 per dozen pairs.

Then, the "Total Manufacturing Cost before Adjustments" is the sum of Direct Material, Direct Costs-Misc (if any), Direct Labor and Manufacturing Overhead". In the example, the Total Manufacturing Cost (before adjustments) is 12.543.

Before arriving at the Total Manufacturing Cost, provision is now made to increase the cost for losses on sub-standard product and other inventory shrinkage costs. For this purpose a percentage can be calculated or estimated, depending on the amount of data available at the company, and how other damage, waste and shrinkage factors are taken into account.

In this example, 1% is used as an adjustment factor, and the Total Manufacturing Cost of 12.668 is recorded in the Cost Summary section.

7 - Cost Summary

In this final section, a Calculated Selling Price which includes a predetermined Profit Margin is determined. Also, depending on how one wishes to use this Summary, a Total Cost to Make and Sell is also determined. The Calculated Selling Price is not based in any way (with this approach) on knowledge of the Actual Selling Price, which when making a cost estimate, may not be known.

In this example, for the sake of simplification and ease of calculation, Distribution, Selling, and Administrative Overhead have been consolidated and have been determined to be 23% of the Calculated Selling Price. Planned Profit (before taxes) has been established by management at 8% of the Calculated Selling Price. Then to arrive at the projected Calc SP, it is necessary to take 33.3% of the Total Manufacturing Cost for Operating Overhead, and 11.6% of the Total Manufacturing Cost for Profit. Then, once the Actual Selling Price is known (and this must obviously depend primarily on the marketplace using the cost calculations only as a guide and a lower limit) the Actual Gross Margin can be calculated. In this case, the Actual Gross Margin calculates to 33.3%, compared to a Standard Gross Margin of 31.0% (23.0% plus 8.0%).

C1.2 More Advanced Version of a Cost Sheet

Exhibit 4 illustrates a Cost Sheet covering the same product as was shown on the previous Cost Sheet. Many aspects of the two Cost Sheets are similar, by design, but the Exhibit 4 illustrates a number of important refinements and concepts, relative to costing. A primary objective of this Manual is to provide a sense of perspective to the smaller manufacturer on product costing. A common sense principle to be followed in choosing a costing approach is to use the simplest method that fits a particular situation. Where growth is an imminent possibility, this of course should be factored into the situation. In any case, with regard to costing and cost systems, it is useful for a small manufacturer to have a sense of logical progession in these matters and to know about important alternative approaches that will provide advantage in altered circumstances.

The Header section and Product Specs section for Exhibits 3 and 4 are identical. The Direct materials sections are also very similar with the exception that Exhibit 4 makes it possible to apply a Waste % against each material, rather than an overall % against the total of all materials. This is an advantage where it is known that certain materials are more susceptible to recuts, waste, etc., than others.

The Direct Costs - Misc section is identical on both forms.

Significant changes in the forms start with Direct Labor. On this form, the costs for the various operations can be assigned to different cost centers for one or two purposes:

a - Sometimes a significant increase in accuracy can be achieved by replacing the single plant-wide cost ratio, by separate cost ratios for each department or cost center. This will be true if the cost ratios vary substantially from one department to another, and if some products have a disproportionate percentage of labor cost in one department as compared to the average product. Theoretically, separate cost ratios give more accurate results; realistically, the degree of this advantage will depend on the factors above.

Exhibit 4 illustrates a multi cost ratio approach. As is discussed in Section D. Cost Management, departmental (or cost center) cost ratios should be routinely calculated for the purpose of Cost Management. Thus, such data ought to be available, quite aside from Costing. Management must decide whether it will derive advantage in Costing by using departmental Cost Ratios.

b - In Exhibits 3 and 4 it is assumed that Manufacturing Overhead is best applied as a percentage of labor, although in some instances there may be an alternative method which is better and this is discussed in Section C3.

In Exhibit 3 one plant-wide overhead rate is used. In Exhibit 4, a different Overhead rate is used for each Cost Center. Hence, the Direct Labor Totals by Cost Center ($.300, $2.187, $.773) are used not only to provide a Total Direct Labor of $3.260, but are also the base against which the Manufacturing Overhead is applied.

The Manufacturing Overhead application in Exhibit 4 differs from that in Exhibit 3 in two ways:

(1) as mentioned, overhead is applied for each of more than one cost center, and

(2) for each cost center, the Variable component of Overhead is applied with one rate, and the Fixed component is applied with another rate, for reasons that are discussed in Section C3, and which will be partly explained in the course of this Cost Sheet explanation.

This form also permits costing with full-absorption costing for both a Budgeted Volume level, and for a Contingency Volume level, if so desired. Until Manufacturing Overhead is encountered, the Costs accumulated (Direct) are the same for any Volume level. This is also true of the Variable Manufacturing Overhead. From that point on, however, Budgeted Volume costs are shown in the right-most column. Contingency Volume Costs would be shown in the adjacent-to-the-left column. For special situations, there will often be advantage in being able to conveniently cost a product at a volume other than that budgeted.

On Exhibit 4, no entries have been made for Contingency Volume costs, since the calculations would be directly similar to that done for the Budgeted Volume. The Contingency Volume cost figures would appear in the vertical column on the form where no entries are showing, and on the Manufacturing Overhead - Fc line which has no entries showing.

The Total Manufacturing Cost (before adjustments) is gotten by totaling the appropriate figures above. In the case of the Budgeted Volume costs, these figures have a black dot to the right, and the total is placed in the box with two black dots to the right. For the Contingency Volume costs, the Total Variable Manufacturing Cost is entered in the box with two black dots to the left. This total represents the sum of all of the figures above this line with a black dot to the right.

For Contingency Volume costs, after the Manufacturing Overhead F-contingency has been calculated and totaled in its box, this total and the Total Variable Manufacturing Cost are added to give the Total Manufacturing Cost (before adjustments).

Adjustment for Inventory Shrinkage, Substandard Product is calculated as previously explained for Exhibit 3, and the Total Manufacturing Cost (after adjustments) is recorded on the appropriate line in the Cost Summaries Section.

The Cost Summaries section is divided into two sections:

(1) Contribution Cost Summary (which could also have been labeled Direct Costing or Variable Costing)

(2) Gross margin Cost Summary which is based on Full-Absorption costing.

In this format, Distribution, Selling, and Administrative Overhead and Profit are separately listed so that the data for Variance Analysis is available. If such data were not desired, the items could be combined on the Cost Sheet, in a manner similar to that on the first Cost Sheet.

Also, each of the Overhead categories is separated into Fixed and Variable. In this example, it has been assumed that all of the Administrative is fixed, all of the Distribution is variable, and the Selling is a combination of Fixed and Variable.

This Fixed/Variable breakdown facilitates development of overhead rates, Variance Analysis, and Variable Costing.

In the Gross Margin Cost Summary, illustrative percentages have been recorded, based on total Distribution equal to 5% of Calc SP, total Selling equal to 10% of Calc SP, total Administrative equal to 8% of Calc Sp, and total Profit equal to 8% of Calc SP.

As done previously in Exhibit 3, the Calculated Selling Price is determined as well as the Total Cost (to make and sell).

If the Actual Selling Price is known (as is assumed here) then the Actual Gross Margin can be calculated. In the example, it is 33.2% versus a budgeted 31.0%. (5%+10%+8%+8%).

C1.3 Variable Costing

With the Cost Sheet format of Exhibit 4, the Variable Cost of the product is easily determined as is shown in the section marked "Contribution Cost Summary".

The Total Manufacturing Cost-Variable is obtained by listing and totaling Direct Material, Direct Cost-Misc, Direct Labor, Manufacturing Overhead - Variable, Adjustment (% of preceding). To this is added any other Variable Costs - Distribution, Selling, Administrative. The grand total is the Total Variable Cost, which if it has been calculated correctly represents the out-of-pocket cost to make a dozen pairs of the product. A Selling Price above this amount will make some contribution toward fixed overhead/profit. With a Selling Price below this amount, the difference between the SP and the Total Variable Cost represents pure, unrecoverable, "bottom line" loss.

If in this case we assume 25% of Calc SP as representing Standard Contribution, then the Calc SP is 133.33% of the Total Variable Cost.

If the Actual SP is 19.000, and the Total Variable Cost is 13.901, then the Actual Contribution as a % of Variable Cost is 36.7% (versus 33.33% budgeted). This actual contribution can also be expressed as 26.8% of Selling Price (versus 25.0% of Calculated Selling Price which was budgeted).

C1.4 Direct Labor/Manufacturing Overhead Costing Rates

Exhibits 1A, 2A, 3A, and 4A are identical to Exhibits 1, 2, 3, and 4, except that the so-called Direct Labor Cost Ratio is no longer shown on the Cost Sheets. The Manufacturing Overhead Rates have been adjusted to reflect the costs included in the Cost Ratio.

Exhibit 1A

COST SHEET ILLUSTRATIVE FORMAT SIMPLIFIED VERSION	☐ COST ESTIMATE STANDARD COST ☐	PRODUCT GROUP	STYLE NO.
DESCRIPTION:	PATTERN	REPLACES STYLE NO.	SPEC NO
	LINING	SPEC NO	DATE
MADE SPECIAL FOR	APPROVED BY	DATE	PREP BY

● PRODUCT SPECS

PART	DIE NO	WT (OZ)	MAT'L NO.	WRIST TYPE	CUT SIZE:	FIN SIZE:
PALM				CUFFING		
THUMB						
FINGERS				OPERATION		
				NEEDLE THREAD		
BACK				LOOPER THREAD		
				SEAM WIDTH		
				STITCHES PER IN		

ELASTIC

BINDING

CARTON NO. Q/CARTON STAPLE TICKET

CASE NO. TAG POLYBAG

● DIRECT MATERIALS

DESCRIPTION	MAT'L NO.	ALLOWANCE	UM	PRICE		AMOUNT
		TOTAL DIR M COST BEFORE %	WASTE, REJECT %	TOTAL DIRECT MAT'L →		

● DIRECT COSTS - MISC

OUTSIDE CONTRACTING	→	

● DIRECT LABOR

OPERATION / PROCESS	AMOUNT
TOTAL DIRECT LABOR	TOTAL DIRECT LABOR →

● MANUFACTURING OVERHEAD (AND ADJUSTMENTS TO MFG COST)

TOTAL FACTORY OVERHEAD = TOTAL DIRECT LABOR × OVERHEAD %	OVERHEAD %	TOTAL MFG OVHD COST →	
TOTAL MANUFACTURING COST BEFORE ADJUSTMENTS			
ADJUSTMENT FOR INVENTORY SHRINKAGE, SUB-STANDARD PRODUCT			

●

	TOTAL MANUFACTURING COST	
	DISTRIB, SELLING, ADMIN	+
	PROFIT	+
	TOTAL COST (TO MAKE AND SELL)	
	CALCULATED SP	
	ACTUAL SP	
	ACTUAL GROSS MARGIN - %	

Exhibit 2A

COST SHEET — ILLUSTRATIVE FORMAT MODIFY TO SUIT INDIVIDUAL REQUIREMENTS	☐ Cost Estimate / Standard Cost ☐	PRODUCT GROUP	STYLE NO.
DESCRIPTION:	PATTERN	REPLACES STYLE NO.	SPEC NO.
	LINING	SPEC NO	DATE
MADE SPECIAL FOR	APPROVED BY	DATE	PREP BY

● PRODUCT SPECS

PART	DIE NO.	WT (oz)	MAT'L NO.
PALM			
THUMB			
FINGERS			
BACK			

WRIST TYPE — CUT SIZE: — FIN SIZE:

CUFFING

OPERATION	
NEEDLE THREAD	
LOOPER THREAD	
SEAM WIDTH	
STITCHES PER IN	

ELASTIC

BINDING

CARTON No. — Q/CARTON — STAPLE TICKET

CASE No. — TAG — POLYBAG

● DIRECT MATERIALS

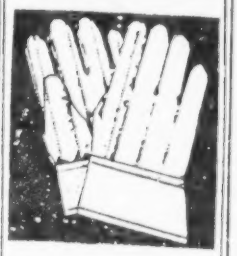
DESCRIPTION	MAT'L NO	ALLOWANCE	UM	PRICE	WASTE %		AMOUNT
						TOTAL DIRECT MAT'L →	

● DIRECT COSTS - MISC

OUTSIDE CONTRACTING →	

● DIRECT LABOR

OPERATION/PROCESS	COST CENTERS OR PLANT				
DIRECT LABOR TOTALS BY COST CENTER					TOTAL DIRECT LABOR →



● MANUFACTURING OVERHEAD (AND ADJUSTMENTS TO MFG COST)

MFG OVERHEAD - V	%					TOTAL MFG OVHD - V →	
	AMT						
TOTAL VARIABLE MANUFACTURING COST (BEFORE ADJUSTMENTS)							
MFG OVERHEAD - F_B	%					TOTAL MFG OVHD - F_B →	
	AMT						
MFG OVERHEAD - F_C	%						TOTAL MFG OVHD - F_C
	AMT						
TOTAL MANUFACTURING COST BEFORE ADJUSTMENTS							
ADJUSTMENT FOR INVENTORY SHRINKAGE, SUB-STANDARD PRODUCT - V							

● COST SUMMARIES

CONTRIBUTION COST SUMMARY	
DIRECT MATERIAL	
DIRECT COST - MISC	
DIRECT LABOR	
MFG OVHD - V	
ADJUST TO MFG COST	
TOTAL MANUF COST - V	
DISTRIBUTION - V	
SELLING - V	
ADMINIS - V	
TOTAL VARIABLE COST	
PLANNED CONTRIB %	
CALC SP	
ACTUAL SP	
ACTUAL CONTRIB - %	

GROSS MARGIN COST SUMMARY		C	B	CONTINUG. VOLUME	BUDGET VOLUME
TOTAL MFG COST (INCL F+V MFG OVHD)					
DISTRIB %	V				
	F				
SELLING %	V				
	F				
ADMINIS %	V				
	F				
PROFIT %	V				
TOTAL COST (TO MAKE AND SELL)					
CALC SP					
ACTUAL SP					
ACTUAL GROSS MARGIN - %					
ACTUAL NET PROFIT MARGIN - %					

Exhibit 4A

COST SHEET (ILLUSTRATIVE FORMAT MODIFY TO SUIT INDIVIDUAL REQUIREMENTS)	☑ COST ESTIMATE / STANDARD COST ☐	PRODUCT GROUP	STYLE NO.
DESCRIPTION: Everyuse Gloves	PATTERN Clute	Super Strong	1234
	LINING	REPLACES STYLE NO. –	SPEC NO. SS-425
MADE SPECIAL FOR Z-Mart	APPROVED BY JB	SPEC NO SS-424	DATE 9-10-82
		DATE 12-15-81	PREP BY WG

● PRODUCT SPECS

PART	DIE NO.	WT (OZ)	MAT'L NO.
PALM	G56	3oz	L 8623
THUMB	G83	8oz	F 1286
FINGERS	G83	8oz	F 1286
BACK			

WRIST TYPE — CUT SIZE: — FIN SIZE:

CUFFING

OPERATION	Close
NEEDLE THREAD	30-3
LOOPER THREAD	60-2
SEAM WIDTH	1/8"
STITCHES PER IN	10

ELASTIC

BINDING

CARTON No. B4200 Q/CARTON 12 STAPLE TICKET

CASE No. C 7722 TAG POLYBAG

● DIRECT MATERIALS

DESCRIPTION	MAT'L NO	ALLOWANCE	UM	PRICE	WASTE %		AMOUNT
Leather - Splits	L 8623	8.163	Ft	.50	1%	108/88	4.363
Verituff - Fabric	F 1286	2.350	L Yds	1.00	2%		2.397
Thread - Est					–		.200
Misc. incl Tickets,	MISC-1		Doz	.15	1%		.152
Labels, etc							.101
1 Doz. Carton	B4200	1	ea	.10	1%		.150
6 Doz. Case	C 7722	1/6	ea	.90	–		
						TOTAL DIRECT MAT'L →	7.363

● DIRECT COSTS - MISC

OUTSIDE CONTRACTING

DIRECT LABOR → –

OPERATION/PROCESS	COST CENTERS on PLANT CC-1	CC-2	CC-3	
Incentive: Oper A Cut	.252			
B Stitch 1		1.135		
C Stitch 2		.425		
D Stitch 3		.0844		
E Form			.415	
Direct TW: Oper F. Pack			.208	
DIRECT LABOR TOTALS BY COST CENTER	.252	1.6444	.623	

TOTAL DIRECT LABOR → 2.519

MANUFACTURING OVERHEAD (AND ADJUSTMENTS TO MFG COST)

MFG OVERHEAD - V	%	48.78%	58.88%	61.30%	
	AMT	.183	1.462	.382	

TOTAL MFG OVHD-V → 1.967

TOTAL VARIABLE MANUFACTURING COST (BEFORE ADJUSTMENTS) : 11.849

MFG OVERHEAD - F_B	%	22%	20%	28%	
	AMT	.066	.437	.216	
MFG OVERHEAD - F_C	%				
	AMT				

TOTAL MFG OVHD - F_B → .719

TOTAL MFG OVHD - F_C →

TOTAL MANUFACTURING COST BEFORE ADJUSTMENTS : 12.568

ADJUSTMENT FOR INVENTORY SHRINKAGE, SUB-STANDARD PRODUCT - V 1% .126

● COST SUMMARIES

CONTRIBUTION COST SUMMARY	
DIRECT MATERIAL	7.363
DIRECT COST - MISC	–
DIRECT LABOR	3.260
MFG OVHD - V	1.226
ADJUST TO MFG COST	.118
TOTAL MANUF COST - V	11.967
DISTRIBUTION - V	.919
SELLING - V	1.015
ADMINIS - V	–
TOTAL VARIABLE COST	13.901
PLANNED CONTRIB - % OF TVC	33.33%
CALC SP	18.534
ACTUAL SP	19.000
ACTUAL CONTRIB - % OF TVC	36.7%

GROSS MARGIN COST SUMMARY		C	B	CONTING. VOLUME	BUDGET VOLUME
TOTAL MFG COST (INCL F&V MFG OVHD)					12.694
DISTRIB %	V	7.24%			.919
	F	–	–		–
SELLING %	V	8.00%			1.015
	F		6.48%		.823
ADMINIS %	V	–			–
	F		11.58%		1.470
PROFIT %	V	11.6%			1.470
TOTAL COST (TO MAKE AND SELL)					
CALC SP					18.391
ACTUAL SP					19.000
ACTUAL GROSS MARGIN - %					33.3%
ACTUAL NET PROFIT MARGIN - %					

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Exhibit 3A

COST SHEET — ILLUSTRATIVE FORMAT SIMPLIFIED VERSION	☑ COST ESTIMATE / STANDARD COST ☐	PRODUCT GROUP: Super Strong	STYLE NO. 12.34
DESCRIPTION: Every Use Gloves	PATTERN: Chute	REPLACES STYLE NO.	SPEC NO: SS-425
	LINING	SPEC NO	DATE: 9-10-82
MADE SPECIAL FOR: Z-Mart	APPROVED BY: JB	DATE	PREP BY: WE

● PRODUCT SPECS

PART	DIE NO	WT (OZ)	MAT'L NO.
PALM	G56	3oz	L8623
THUMB	G83	8oz	F1286
FINGERS	G83	8oz	F1286
BACK			

WRIST TYPE — CUT SIZE: — FIN SIZE:

CUFFING

OPERATION	Close
NEEDLE THREAD	30-3
LOOPER THREAD	60-2
SEAM WIDTH	1/8"
STITCHES PER IN	10

ELASTIC

BINDING

CARTON NO. B4200 Q/CARTON 12 STAPLE TICKET

CASE NO. C7722 TAG

POLYBAG

● DIRECT MATERIALS

DESCRIPTION	MAT'L NO.	ALLOWANCE	UM	PRICE		AMOUNT
Leather - Splits	L8633	8.163	Ft	.50	108/98	4.320
Verituff	F1286	2.350	Lyds.	1.00		2.350
Thread-est						.200
Misc-incl Tickets, Labels, etc.	Misc-1		Doz	.15		.150
1 Doz Carton	B4200	1	ea.	.10		.100
6 Doz Case	C7722	1/6	ea.	.90		.150
		TOTAL DIR M COST BEFORE % 7.270	WASTE, RECUT % 1.0%	TOTAL DIRECT MAT'L →		7.343

● DIRECT COSTS - MISC

OUTSIDE CONTRACTING

● DIRECT LABOR

OPERATION / PROCESS	AMOUNT
Incentive	
Operation A Cut	.252
B Stitch 1	1.135
C Stitch 2	.425
D Stitch 3	.0844
E Form	.415
Direct TW:	
Operation F Pack	.208
TOTAL DIRECT LABOR	TOTAL DIRECT LABOR → 2.519

● MANUFACTURING OVERHEAD (AND ADJUSTMENTS TO MFG COST)

TOTAL FACTORY OVERHEAD = TOTAL DIRECT LABOR × OVERHEAD %	OVERHEAD % 106.43%	TOTAL MFG OVHD COST → 2.681
TOTAL MANUFACTURING COST BEFORE ADJUSTMENTS		12.743
ADJUSTMENT FOR INVENTORY SHRINKAGE, SUB-STANDARD PRODUCT	1%	.125

Note: Specs, Quantities Costs, and Rates Shown have no Significance

Purpose of Entries is to illustrate calculations and arrangements of cost sheet data.

TOTAL MANUFACTURING COST		12.668
DISTRIB, SELLING, ADMIN	33.3%	4.218
PROFIT	11.6%	1.469
TOTAL COST (TO MAKE AND SELL)		16.886
CALCULATED SP		18.355
ACTUAL SP		19.000
ACTUAL GROSS MARGIN - %		33.3%

It will be noted that with the Manufacturing Overhead adjustment, the total costs on 3 and 3A are the same and the total costs on 4 and 4A.

This variation in the method of calculation has been included here because this combination of the excess labor costs (otherwise known as labor inefficiency cost or cost ratio costs or labor burden) and the manufacturing overhead is supposedly very common in the Work Glove Industry. Many companies apparently list and total all incentive payment labor costs and put all additional labor costs into the manufacturing overhead.

Each method, if based on correctly determined costing rates, will result in the same total cost (assuming that Manufacturing Overhead is calculated as a percentage of Labor $).

One advantage of combining excess labor costs with manufacturing overhead is relatively minor -- it eliminates one or more steps in the calculation, depending on how many cost centers there are.

The main advantage of using Labor Cost Ratios, separated from Manufacturing Overhead, is related to Cost Control. Calculating such Labor Cost Ratios each week for each department and for a factory as a whole and analyzing its components, is an important element in cost control. Hence, current data (as well as past data) should always be available for Cost Ratios. Further, in the analysis of variances, it is very advantageous to keep Labor Variances separate from other Manufacturing Overhead Variances.

Labor Variances must be reported and must be monitored much more frequently than Manufacturing Overhead Variances.

Further, a Standard Cost Ratio applied to Incentive Standards provide Standard Labor Costs that are analagous to the Actual Labor Costs of a factory department, and the difference is a meaningful variance.

With separate percentages for Labor Cost Ratio and Manufacturing Overhead, there is usually a better understanding of the key elements of cost.

C2. Determining Material and Labor Costs

C2.1 Direct Materials Costs

The cost of direct materials is the largest single major cost element on a typical Work Glove Cost Sheet. Hence, its importance cannot be overemphasized.

Two main components are involved in the cost of a particular material for a particular product: the quantity of material required and the price of the material. A third component can also be distinguished from the Cost Sheet calculations that have been reviewed: Waste incurred or detected beyond the originating department.

The quantity required of a particular material for a particular product is usually referred to as the Material Requirement or the Material Allowance. On the illustrative Cost Sheets this Allowance was expressed as the quantity in the units of measure designated for one dozen pairs of gloves (e.g. 2.350 Lineal Yeards per Dozen Pairs). It is typical and practical for this Allowance to include the waste that can normally be anticipated in the originating operation whether that operation is Cutting, Knitting, Stitching, or another.

As was previously mentioned in the section on Standard Costs and Budgets, an essential ingredient for Direct Material (as well as Direct Labor) is a reliable measurement. For a new product, measurement must be made using the patterns or samples of each size or an average size. Depending on the material involved, the measurement (including waste) may be in square feet (e.g. ft of leather), lineal yards of a material of a designated width (e.g. lineal yards of flannel), lineal yards of a spooled material (e.g. lineal yards of binding), pounds of yarn (e.g. pounds of a particular yarn for a knit glove or a knit material), pounds of leather (when it is more convenient to use such a unit of measure), units (e.g. cartons), etc.

Where waste is not an intrinsic factor in the process of preparing or using a raw material, taking a measurement can be rather straightforward. However, wherever waste is involved in the process, taking a measurement to determine the requirement is more difficult. It is a fact of life in the Work Glove industry that most direct materials do involve waste - typical examples are the waste in die cutting of spread fabrics, knitting of gloves and tubing, use of binding and elastic in stitching, etc.

With the waste condition present, an initial measurement can always be made, but such measurements should be regarded as estimates, pending the accumulation of adequate yield data from production. The phrase adequate yield data is used to take account of the fact that yield typically fluctuates from one occasion to another due to a variety of factors that may be affecting the operation. If no unusual conditions exist at a given time, the fluctuations should typically be within a narrow range for a particular material for a particular product.

When a material requirement measurement is made, the goal for setting a standard is to determine the average yield (for that material, for that product, for a specific size or an average of a standard mix of sizes) that will take place under reasonably efficient or average operating conditions. Various approaches are used in making such initial measurements. For example, in die cutting, a marker for a particular width is often made to determine the yield, sometimes after an empirically derived adjustment factor is applied. When production data becomes available, the original measurement, which is effectively an estimate, will be modified to get closer to a more accurate result. With leather die cutting, where a marker is not feasible, there are various systems for determining the square footage of

leather that will be required. One basic approach is to lay out the patterns that will be used on a grid of 1/2 inch squares, and from that, to estimate the area (expressed in square feet) that will be taken by both the cut parts and the waste of cutting. As is true with all die cutting, the way in which patterns are arranged is crucially important.

In these techniques of measurement, small variations in approach from one company to another need not present a problem, as long as the approach is logical, is applied consistently, and empirically derived adjustment (correction) factors are applied when indicated.

Material requirements measurements must be reasonably accurate, but a perfect measurement or standard is not likely to exist as long as waste that is influenced by both unpredictable and random factors, is a major element. Hence, the total effect of all standards as a whole must be monitored, and individual standards must be monitored.

The Materials Quantity Variance Analysis described in Section D will provide an overall control. Ideally, the total Quantity Variance should be zero; practically, a satisfactory situation exists when the Quantity Variance is a reasonably small favorable amount. If the Quantity Variance is an overly great favorable amount, the Materials Requirements may be overstated, with all of the consequences that such a condition implies.

As explained in Section D, Quantity Variance analysis should extend to individual products (styles), to individual materials, and to individual cutters.

With respect to leather cutting, there are special considerations because of the fact that leather is a natural product, with variations in quality and defects from one piece to another, and random configurations from one piece to another. Further, leather may be received in graded lots (with an appropriate price per foot) or in lots containing many grades (with an appropriate price per foot).

One of the approaches used in the work glove industry to deal with the special factors involved with leather is the use of two Adjustment Factors.

One factor - a Differential - is used to adjust for the Quantity Yield that will result with different types of leather. The Allowance for a particular style is based on the area required for the cut parts and the normal waste around those cut parts. However, if the parts are cut from sides, one actual yield can be expected; if the parts are cut from bellies (which is subject to more irregularities and defects than sides), then another actual

yield will result. The different yields will take place even though the cut parts are the same area; in the case of bellies there will simply be more waste. The Differential (expressed as a percentage) is a factor which when multiplied by the Allowance (before Differential) will provide an Allowance (Adjusted or after Differential) which will more accurately reflect the actual yield that can be expected.

Another factor - a Grade factor - is used to adjust the price of mixed-grade leather, when a particular product is based on the use of a specified grade of leather. When the Grade factor (expressed as a percentage) is multiplied by the unit price of leather which is purchased on a multi-grade basis, the leather cost for the particular product has been adjusted for the leather grade that is specified for that product. Note: The Grade factor is unnecessary if the unit price of the leather is for the particular grade used in the product, and the leather is purchased and priced in graded lots.

On the illustrative Cost Sheet (Exhibits 3 and 4), a leather material is shown on the first line of the Direct Materials section.

On Exhibit #4, the $4.320 per dozen for Leather (Mat'l No. L8633) is obtained by multiplying the Allowance of 8.163 ft. per dozen pairs by $.50 per ft. by 108% (the Differential) and by 98% (the Grade factor). Similarly, on Exhibit #3, $4.363 = 8.163 x .50 x 1.08 x .98.

The Waste % which appears on the illustrative Cost Sheets (on each material line of Exhibit 4 and on the total material line of Exhibit 3) should represent material waste that is incurred or detected after the originating operation. Essentially it should cover recuts, or in-process damages or shortages. In some companies such losses are only reflected in the Adjustment to the total manufacturing cost or are included in manufacturing overhead. However, with this approach, Standards and therefore Materials Quantity Variances are more accurate.

Such Waste percentages are often "guesstimated". Ideally, for some items there should be record-keeping on an ongoing basis. Such record-keeping is often ignored either as being too costly for the benefits to be obtained or as an "irritating" chore. Each situation requires its own evaluation as to how far it is worth going with such record-keeping. However, even when no regular record-keeping is done, or limited record-keeping is done, spot "period checks" ought to be undertaken to determine how significant the Waste factor may be, as a whole and for particular items.

Since the Standards will include the Waste %, ultimately the Quantity Variance Analysis will indicate how well actual and standard are matched.

C2.1.1 Price Component

The materials prices on a Product Cost Sheet should depend on the kind of cost sheet being prepared, company policy, and other factors.

If a standard Cost Sheet is being developed for a new 6 month season, or for a new year, the standard price should be based on current price adjusted for factors and trends that may influence the price during the projected period. The actual price or quantity of current stock of the material may or may not influence the Standard Price, depending on management decision.

If a Cost Estimate Cost Sheet is prepared either for a new product or an existing product for which standards already exist, current price will normally be used, so as to arrive at an up-to-date cost. Where materials prices change in the course of an accounting period, standards may or may not be

changed. From a record-keeping point of view it is very much better not to change standards in mid-stream. However, for new Cost Estimates, material costs should obviously reflect the latest material prices, so that new Selling Prices are up to date.

In Section D., Purchase Price Variances are discussed. Mention is made of the fact that Price Variances can be determined at the time of purchase of materials or at the time of use of materials. Each has its advantages, but at the time of purchase is more common, is more convenient, and is more timely from a management control point of view.

C2.2 Direct Labor Costs

The cost of direct labor, although typically not as great as direct material cost is important in two respects: (1) it is a very significant cost in and of itself, and (2) manufacturing overhead, which will typically include payroll fringe costs, is usually allocated to a product on the basis of how much labor ($ or Hours) is required by the product. (Also, labor cost is frequently the key factor in determining plant capacity.)

As with Direct Material, there is a Wage Rate component and a Time (Quantity) component. Beyond that however, there are a number of components that are special to labor.

C2.2.1 Time Component of Direct Labor Cost

The time component of Direct Labor may be seen as the Quantity of Time required to do each operation. This Quantity of Time, in turn, usually has a measured component and an estimated component.

The measured component is usually reflected in an incentive standard (which may be Standard Hours per dozen or $ per dozen or some other rate) and ideally is determined by the measurement technique known as time study. There are other less effective techniques of determining incentive standards such as by the analysis of past production records or by using another company's standard. The latter approaches often result in inaccurate standards.

The estimated component is the additional amount which must be added to each incentive standard in order to allow for all of the "extra" payroll cost which regularly occurs in manufacturing departments. Included here are such items as overtime premium, make-up, non-standard allowances, repairs, samples, machine downtime, etc. The Cost Ratio will be that number which when multiplied by the Incentive Labor Cost will provide the total Labor Cost for that operation.

As is illustrated in Exhibits 3 and 4, the Cost Ratio (which if used on the Cost Sheet will be referred to as the Standard or Budgeted Cost Ratio) can either be applied to Incentive Labor Costs on a Cost Center basis or a plant-wide basis.

As is discussed in Section 4., on Variance Analysis, with effective Labor Cost Control, such a Cost Ratio, should be calculated each week for each department and for a factory as a whole. By analysis of such reports over a reasonable period of time (preferably a year) a Standard Cost Ratio for each department and for the factory as a whole can be developed. The calculation on the Cost Sheet is very simple.

However, in order to accurately calculate Cost Ratio weekly, a few basic points must be made. Cost Ratio is simply defined as follows:

$$\text{Direct Labor Cost Ratio} = \frac{\text{Total Direct Payroll}}{\text{Incentive Standard Labor Cost}}$$

If every Direct Labor operation is on incentive, then the above applies as shown. However, as is not infrequently the case, some Direct Labor operations are not on incentive, but are on time work, either because an incentive standard has not yet been established or because there is some other condition making it impractical to have the operation on incentive. (In such instances, an equivalent incentive standard based either on measurement or estimate should be recorded on the Cost Sheet.) On the Weekly Labor Cost Analysis where the Actual Cost Ratio is calculated, such Direct Time Work should be divided into two parts: equivalent incentive standard earnings based on calculation using the standard appearing on the Cost Sheet and the balance of the payment which is Unearned Direct Time Work (or Direct Time Work Make-Up) (See Exhibit 28). Then in calculating the Direct Labor Cost Ratio the equivalent incentive standard earnings will be included in the denominator which is Incentive Standard Labor Cost. The Unearned Direct Time Work will, of course, be part of the Total Direct Payroll.

Another category of departmental payroll that must be reckoned with is indirect labor. Supervision and sometimes mechanics should logically be included in Manufacturing Overhead. As a matter of clerical convenience, such payments can be made part of a Manufacturing Overhead payroll.

However, in many departments there may be additional indirect labor (typically lower skill levels than Supervisors or mechanics) e.g. material handlers. Such payroll cost can also be part of manufacturing overhead. However, because the payroll cost for such personnel tends to rise and fall according to the departmental volume level, these costs are variable, and without any loss of accuracy can be made part of the Cost Ratio, which now becomes more precisely a Departmental Labor Cost Ratio. However, since the total Labor Cost thus calculated is fully variable, it is common to still refer to this Labor Cost as the Direct Labor Cost.

The Rate component in the Labor Cost, in most situations in the Work Glove Industry, is not nearly as important as Price in Materials Cost, to which it is analagous. It is practical to include all labor variances (Rate and Efficiency) together. Thus the Total Labor Variance will be the difference between the Actual Cost Ratio and the Standard Cost Ratio, multiplied by the Incentive Standard Labor Cost.

When a Standard Hour Incentive Plan is used, the Incentive Standard Labor Cost is equal to the Standard Hours per dozen

for that operation, multiplied by the Standard Dollars per Hour for that operation.

C.3 Determining Manufacturing Overhead

C3.1 Types of Overhead

From a product costing point of view, there are two broad categories of overhead:

- Manufacturing Overhead
- Non-Manufacturing Overhead, which typically includes:
  - Distribution Overhead
  - Selling Overhead
  - General & Administrative Overhead

Non-manufacturing Overhead is typically referred to as Operating Expense or as Period Costs.

In conventional product costing (known as full-absorption costing) all manufacturing overhead will become part of the Manufacturing Cost.

Further, in conventional product costing, the total Selling Cost (cost to make and sell before profit) will be the total Manufacturing Cost plus the Non-Manufacturing Overhead.

C3.1.1 Overhead Defined

In the previous sections, it has been noted that direct materials and direct labor costs can be directly traced to and directly identified with each unit of manufactured product. This, in fact, is the definition of such manufacturing costs.

Manufacturing overhead is the total of those indirect costs of manufacturing which cannot be linked directly to a product. Such costs must be therefore allocated in some logical, but indirect way to each product. Precisely because of this indirect allocation, there are, in many respects, more complexities in applying manufacturing overhead to product cost than is the case with direct labor and direct material.

Non-manufacturing overhead is similarly an indirect cost that must be allocated to each product, if one wishes to calculate a total Selling Cost. (The Selling Cost can in turn be taken further to a theoretical or "Calculated" Selling Price, using a management determined profit margin. Obviously, this Calculated Selling Price should then be used as one of the elements in determining the Actual Selling Price.)

C3.2 Elements of Manufacturing Overhead

Typical elements of cost in manufacturing overhead are the following:

- Indirect labor
- Indirect materials
- Departmental supervision
- Plant-wide supervision
- Maintenance labor
- Machine parts
- Repairs by outside contractors
- Depreciation (equipment, factory, building, etc.)
- Fuel
- Electricity
- Property taxes
- Payroll taxes
- Employee insurance
- Employee vacations
- Property and liability insurance

C3.2.1 Need for a Manufacturing Overhead Budget

As has previously been discussed, if a company is to have product costing that is meaningful, it must in effect have a budget for all manufacturing overhead costs (as well as for non-manufacturing overhead costs). If this budget is created as a relatively informal "estimate" of future costs and its use is limited only to product costing, it may be referred to as an "overhead estimate", but it is nevertheless a budget in the sense described in the Section on Standard Costs and Budgets.

Very obviously, the more care and analysis used in determining this budget, and the more effort that is made to utilize this budget for such functions as variance analysis and standard cost accounting, the greater will be the value of such a budget.

Normally, it is most logical to budget for the upcoming year. This time period provides a reasonable averaging of seasonal variations and costs that are annual by nature or by time of payment.

C3.3 Predetermined Overhead Rate

To apply to each product a logical portion of the budgeted manufacturing overhead, it is necessary to calulate what is commonly referred to as a Predetermined Overhead Rate. This can be defined as follows:

$$\text{Predetermined Overhead Rate} = \frac{\text{Budgeted Total Overhead}}{\text{Budgeted Volume Level}}$$

C3.3.1 Choice of Denominator for Predetermined Overhead Rate

The denominator of the Predetermined Overhead Rate must be a logical measure of activity or volume that is common to all jobs for the products for which it is used, must be a measure that is readily available, and must be logically related to the incurrence of overhead costs.

Typically used denominators are direct labor hours, direct labor dollars and machine hours. All of these factors can logically have use in various situations in the work glove industry. Some companies may have use for two of these factors such as direct labor dollars for most operations and machine hours for some special operations.

For a labor intensive, light manufacturing industry (such as Work Gloves), the two most commonly used denominators should be Direct Labor Dollars and Direct Labor Hours. When there is a choice between these two factors, Direct Labor Hours will normally be given consideration only where a Standard Hour Incentive System is in place, and the hours are thus readily available. Otherwise, it is often practical to use Direct Labor Dollars, which is always available if there is product costing. In terms of choosing the factor that has the closest correlation to the incurrence of overhead, most would agree that Labor Hours have a small edge over Labor Dollars. However, in the Work Glove Industry, where hourly wages tend to fall in a relatively low and narrow range, the technical advantage of hours over dollars will usually be relatively minor, so that the convenience of using dollars will often be the deciding consideration.

Machine hours as a denominator will only have advantage in the Work Glove Industry in a specialized situation where the investment in machinery is relatively high, the overhead that is clearly related to operating that machine is relatively high, and the cost of the labor to run the machine is relatively low compared to the overhead associated with that machine.

A final note on overhead rate denominators: Occasionally, other factors will be found in use. One such factor is units or dozens produced. With this approach a constant dollar per unit or per dozen is applied to all products. The only situation in which this approach should merit consideration is when the product line is limited and the labor content for each work glove in the product line is nearly the same. The Dozens Produced denominator would work satisfactorily in such a situation. The danger is (and it is a likely one in the Work Glove Industry) that at some time a new product might be introduced which has a significantly different labor content than that of the rest of the product line. Then, the product cost would be on very weak ground.

Another overhead rate denominator that is, on rare occasion, found but which, under normal circumstances, has no sound basis in costing logic is the use of combined direct labor dollars and material dollars (prime cost) as an overhead rate denominator in full absorption costing. The fallacy in this approach is simply that there is no significant correlation in the common operations of the work glove industry between material dollars and the incurrence of manufacturing overhead. It should be noted, as is discussed in another Section, that with variable costing (otherwise known as direct or contribution costing), a base equal to the sum of direct labor, direct material, and all variable overhead is used. To this base, all fixed overhead is applied to arrive at a selling cost. The rationale for this approach is explained in the discussion on variable costing. It is obvious, however, that the use of prime cost as an overhead rate denominator in full absorption costing is different in form and concept from variable costing.

C3.3.2 Calculation of Predetermined Overhead Rate

After the unit for the Budgeted Volume Denominator has been chosen, the budgeted amount of those units can be determined. When the Budgeted Volume Level and the Budgeted Total Overhead have been established, the Predetermined Overhead Rate can be calculated and this rate will be used on each Product Cost Sheet.

The following is a brief, simplified example using assumed data:

Direct Labor Hours has been chosen (in this example) as the most suitable denominator for the Predetermined Overhead Rate. (Note: By using Direct Labor Hours rather than Direct Labor dollars, some of the explanations that follow are easier to understand. However, dollars could be substituted for Hours and vice versa.)

For the upcoming year, a Budgeted Volume Level of 175,000 Direct Labor Hours is forecasted.

For this volume level, the Budgeted Total Overhead is determined to be $210,000.

Then, the Predetermined Overhead Rate is calculated,

$$\text{Predetermined Overhead Rate} = \frac{\$210{,}000}{175{,}000 \text{ DLH}} = \$1.20 \text{ per DLH}$$

Assuming that a particular work glove requires 2.0 Direct Labor Hours per dozen, the Manufacturing Overhead would be $2.40 per dozen (2.0 x $1.20).

C3.4 Volume and Fixed and Variable Costs

Consideration of volume is intrinsic to any consideration of overhead, be it manufacturing, selling, administrative or distributive, because a major portion of such overhead is fixed (constant within a given range of volumes). The unit allocation of fixed overhead cost to product depends as much on the budgeted volume level as it does on the budgeted overhead amount.

Manufacturing overhead (and other types of overhead) has two components: a fixed portion and a variable portion. The total amount of variable overhead is directly proportional (linearity is assumed) to the quantity of production.

Note the following:

The unit cost for the fixed portion of overhead will vary with changes in volume.

The unit cost for the variable portion of overhead will remain fixed with changes in volume.

The simple example below illustrates these points:

Overhead Costs at 3 Volume Levels

Assuming Fixed Overhead = $5,000 Variable Overhead = $1.00 per labor $

Volume Level in Labor	Fixed Ovhd	Variable Ovhd
	Unit Costs	
10,000L$	.500/L$ (= $\frac{5,000}{10,000}$)	1.00/L$
20,000L$	.250/L$ (= $\frac{5,000}{20,000}$)	1.00/L$
30,000L$	.167/L$ (= $\frac{5,000}{30,000}$)	1.00/L$
	Total Costs	
10,000L$	$5,000	$10,000
20,000L$	$5,000	$20,000
30,000L$	$5,000	$30,000

In calculating the Predetermined Overhead Rate it is good practice to segregate the fixed and variable costs of the Budgeted Manufacturing Overhead for various reasons:

(1) It will aid in the development of a sound budget. Separation into fixed and variable will provide additional insight into establishing a proper amount for a given volume level.

(2) It will provide management with the required data if it should choose to use variable costing in addition to full absorption costing.

(3) It will provide management with the required data if it wishes to make a breakeven analysis or to study other cost/volume/profit relationships.

To put this matter in clear perspective: It is not absolutely necessary to separate Manufacturing Overhead (and other overhead) into Fixed and Variable components in order to determine a Predetermined Overhead Rate. It is simply a very good idea to do so.

To make this separation into fixed and variable is often very straightforward. (Some items will fall into one category or another.) However, in other cases, approximations must be made, and for practical purposes, minor deviations from a theoretically correct approach will be ignored. Some elements of cost must be divided into a fixed and variable component.

To make this process clearer, a brief comment will be made for each of the typical elements of cost in manufacturing overhead previously listed:

Indirect labor - Departmental indirect labor other than supervision and mechanics will often be considered 100% variable by managements prepared to take stringent measures, when necessary, to make it so by keeping it at an approximately constant percentage of volume.

Indirect materials - Will usually be considered 100% variable. Some materials can be treated either as direct material or indirect material depending on the degree of accuracy deemed worthwhile (e.g. thread)

Departmental supervision - Will usually be considered 100% fixed.

Plant-wide supervision - same as departmental supervision (Note, however, this approach will be correct only for a certain volume range. Beyond this relevant volume range supervisors may be added or subtracted.)

Maintenance labor - Will often be considered 100% fixed, but in many instances depending on a company's policies and operating conditions may be divided into a portion that is fixed and a portion that is variable.

Machine parts - Same considerations as for Maintenance.
Repairs by outside contractors - Same considerations as for Maintenance.

Depreciation (equipment, factory building, etc.) 100% fixed.

Fuel - Normally is 100% fixed, where only heat is involved. When production equipment uses fuel directly or indirectly (e.g. steam from a central boiler), a portion may be considered variable, and the remainder fixed.

Electricity - The portion used for power is for the most part variable. Based on the amount of electricity used for light and the amount used for power, this cost should be divided into proper portions of fixed and variable.

Property taxes - 100% fixed.

Payroll taxes

Employee Insurance

Employee vacations

All three items above should be first segregated by Direct Labor, Manufacturing Overhead (Indirect Labor and Departmental Supervision and Plant-Wide Supervision and Maintenance Labor, etc.), Selling Overhead, Administrative Overhead, Distributive Overhead. Then these and other so-called Payroll Fringe or Payroll Overhead should be allocated as follows:

Payroll Fringe costs associated with Manufacturing (Direct Labor, Indirect Labor, Departmental Supervision, etc.) will be added to Manufacturing Overhead, but the portion which is associated with variable labor (i.e. Direct Labor) should become a variable cost, and the

portion which is associated with fixed labor (e.g. Plant-Wide Supervision) should become a fixed cost. Exhibit 7 is a type of worksheet that can be used to properly allocate payroll fringe costs.

As noted in the section on Direct Labor, there is a school of thought that says with much logic that Payroll Overhead costs typically associated with Direct Labor (FICA, FUI, State UI, Workmen's Compensation Insurance, Health & Welfare direct or union contributions, Vacations, other employee benefits or insurance, etc.) should really be made part of Direct Labor. There is much to commend this approach, but it is more convenient and more conventional to incorporate such costs in Manufacturing Overhead. The final cost results should be the same with either approach. However, even when these items are made part of Manufacturing Overhead management should always be aware of its own Direct Labor Payroll Overhead cost, which currently tends to run from approximately 12% to nearly 30% of Direct Labor, depending on a company's policies and circumstances.

Property and liability insurance - 100% fixed.

Exhibit 7

ANALYSIS OF PAYROLL OVERHEAD - BUDGET WORKSHEET

Analysis by % or $ or both Period Length: From: To:

Element of Cost	Total	Mfg. Ovhd		Distrib		Selling		G&A
		Dir L	Ind L	Var	Fixed	Var	Fixed	Usually 100% Fxd
Total Wages Budgeted								
FICA								
SUI								
FUI								
Work Comp								
Health & Welfare								
Group Insurance								
Special Insurance								
Holidays								
Vacations								
Other Benefits								
TOTALS								

C3.5 Budget Worksheet - Manufacturing Overhead

Included in this Chapter is a Budget Worksheet form (Exhibit 8) for Manufacturing Overhead. Typical items of cost are included on this form, but for each individual situation some modification, addition or subtraction would be necessary.

Since it will normally be useful to be able to refer to last year's Budget (Total, Fixed and Variable) and last year's Actual, for each item of cost, these have been included on the form. At the same time, it is obvious, that last year's Budget and Actual should not be the only factors used in determining a new Budget. Sometimes a very fresh look is needed to go over each item -- the kind of analysis that is implied in Zero Base Budgeting, where an attempt is made to set aside all preconceptions and past history.

For each element of cost, the total amount, the fixed amount and the variable amount should be indicated. For some costs, the entire amount may be fixed (e.g. Depreciation, Supervision); for some costs, the entire amount may be variable (e.g. Payroll overhead costs, indirect materials); and for some costs, the total may be divided between fixed and variable depending on an analysis of how the cost is incurred (e.g. electricity - the portion for lighting is usually fixed; the portion for power used for production is variable).

Exhibit 8

BUDGET WORKSHEET - MANUFACTURING OVERHEAD

Plant: | Period Length: | From: | To:

Element of Cost	Budget			Last Year Budget			Actual
	Total	Fixed	Variable	Total	Fixed	Variable	Total
Dir Labor Payroll Taxes							
Personnel Insur & Benefit							
Holidays & Vacations							
Plant Supervision							
Dept. Supervision							
Dept. Indirect Labor							
Receiving Dept. Costs							
Maintenance Dept. Costs							
Janitorial & Custodial							
Plant Mat'l Hndlg							
Auto/Truck Drivers							
Ind Labor Payroll Taxes							
Personnel Insur & Benefit							
Holidays & Vacations							
Overtime Premium							
Bonuses							
Factory Supplies							
Repairs-Outside Contrctr							
Rent							
Fuel							
Electricity							
Insurance							
Auto/Truck Maintenance							
Auto/Truck Oper Expenses							
Tools & Dies							
Depreciation - Equipment							
Depreciation - Building							
Depreciation - Auto/Truck							
TOTALS							
Budgeted Vol (Units:)							
Percentage							

With the totals from the Worksheet, a Predetermined Overhead Rate can be calculated (Total, and a Fixed and Variable component).

When more than one Predetermined Overhead Rate for Manufacturing Overhead is determined, i.e. when more than one cost center is established, those gross costs which are applicable to more than one cost center must be allocated to each cost center on some reasonable basis. This is normally done on a "Spread Sheet" with the elements of cost listed on the left and the Cost Centers listed across the top.

Typical examples of such allocation to cost centers are the following:

Rent, Heat	- allocated by square feet
Factory Supplies	- allocated by estimated usage
Payroll Fringe Costs	- allocated by budgeted labor in each cost center
Electricity - Light	- allocated by square feet
Electricity - Power	- allocated by estimated power consumption of each cost center
Plant Supervision	- usually allocated by budgeted labor in each cost center

Service Departments:

Maintenance - allocated by estimate or analysis of job times or by equipment depreciation in cost center

Receiving - allocated by material usage or by estimate

Factory Administrative (e.g. engineering, production control) - allocated by number of employees or budgeted labor

Cross-allocation of service departments should only be a consideration in sizeable companies, and there are specialized and sophisticated methods for dealing with such situations.

C.4 Non-Manufacturing Overhead - Total Costs and Calculated Selling Prices

C4.1 Typical items of cost in Non-Manufacturing Overhead

For product costing that provides a Selling Cost (Cost to make and sell) an Overhead Budget must also include Distribution Overhead, Selling Overhead, and General and Administrative Overhead, unless, of course, some of these categories have been combined.

Some typical items that might appear in each are the following:

Distribution Overhead

Warehouse Labor
Warehouse Supervision
Truck Drivers Wages
Truck Maintenance
Truck Operating Expenses
Depreciation - Truck
Depreciation - Equipment
Building Rent
Payroll Overhead Costs
Shipping Supplies
Insurance
Freight-out (non-reimbursed)

Note: In small companies, where Warehousing and Shipping Costs are very small and where Finished Goods Inventory is held to a minimum, so-called Shipping Department costs are sometimes included in Selling Overhead or in Manufacturing Overhead. The best approach is to keep Distribution Overhead as a separate type of non-manufacturing overhead. The next best alternative is to include it with Selling Overhead (making this category, in effect, Selling and Distribution). The last alternative is technically incorrect (since Shipping is not a cost of manufacturing) but often the Shipping cost is so minimal that

in many circumstances the net effect of including shipping department cost in Manufacturing Overhead is not significant. The rationale in a very small company for so doing is based on the fact that there may not be a Finished Goods Warehouse as such that is separate from the factory, the Plant Manager and/or Superintendent may exercise control over the Shipping Department, Shipping and Receiving may be a combined department, and the Shipping Department cost may be considered to be too small to warrant separate treatment. The best long-run approach and the most technically correct is to keep Distribution Overhead as a separate non-manufacturing overhead.

Selling Overhead

- Sales Office salaries
- Sales Executive Salaries
- Payroll Overhead
- Sales Office Supplies & Expenses
- Sales Office Rent
- Telephone
- Heat Electricity
- Advertising
- Promotions & Displays
- Sales Show expenses
- Travel & Entertainment
- Sample Expenses
- Credit & Collection Expenses (as an alternative this may be included in Administrative Overhead)
- Bad Debts
- Depreciation - auto
- Depreciation - furniture & equipment
- Insurance

General and Administrative Expenses

Office Salaries
Executives
Office Supervisors
Payroll Overhead

Office Supplies & Expenses
Stationery and Printing
Dues & Subscriptions
Telephone

Rent
Heat
Electricity

Data Processing
Auto Maintenanc
Auto Operating Expense

Travel & Entertainment
Depreciation - Furniture & Equipment
Depreciation - Auto
Depreciation - Leasehold Improvements
Insurance

In smaller companies especially, there is sometimes a tendency (based on practicality) to minimize the number of non-manufacturing overhead categories. Sometimes in very small companies there is only one category - Operating Overhead or General Overhead. Even when there is more than one operating overhead category, individual elements of cost are not always

accurately divided into the category in which they belong. Some examples: Telephone and travel and entertainment are often not differentiated between Selling and Administrative. Similarly with auto maintenance, Auto operating expenses, Depreciation - Auto. Rent, Heat, Electricity, Insurance, Office Supplies & Expenses, Stationery and Printing are often not allocated to all of the Overhead categories (including Manufacturing) to which they apply. Payroll Fringe costs are very often not properly allocated. Typically Production Scheduling and Factory Payroll Office Salary costs are left in Administrative Overhead, not in Manufacturing Overhead with which they are most closely tied.

Allocating multi-category costs (shared costs) is not especially difficult. It simply requires a "Spread Sheet" with the costs listed on the left (Acct No, Description, Total Amount) and the overhead cost categories listed across the top, and some reasonable amount of analysis to determine a basis for allocation. It also requires a clear understanding of what belongs in each category.

Some elements of cost might be allocated by square footage (rent, heat, light, etc); some by percentage estimate according to where the costs belong (telephone, stationery and printing); some by calculation (payroll overhead). Some elements of cost can be better divided by a finer breakdown of the chart of accounts (depreciation, travel and entertainment).

The degree to which one separates costs and strives for accuracy must depend on the individual situation. In every company, but especially in a small company, the cost of getting more refined, more accurate data must always be set against the benefits that can reasonably be derived.

For product costing purposes, selling and administrative and distribution are typically added to manufacturing cost in a similar way. Hence, for costing it may not make any difference whether a cost has been put into one operating category or another, as long as all costs have been accounted for. However, for cost management or cost control purposes it is advantageous to separate costs correctly so that executives and managers can be held properly responsible for those costs which they influence, and costs can be more easily analyzed.

To this must be added that in a very small company it is often one or two key executives who monitor and control all overhead costs and as long as they have enough information as to the transactions and incidents underlying each cost, the use of 2 or 3 (or more) broad categories of operating expenses may not be absolutely necessary.

The above is mentioned to indicate that sometimes it may be practical to lean in one direction or the other. However, in the long run, reasonable categorization of operating costs is advantageous. In terms of allocation, an approximate approach may be justified with certain individual elements of cost, where there is no significant inaccuracy in the overall results.

C4.2 Budgets for Operating Expenses

In order to calculate a Total Cost for each product (Total Cost to Make and Sell), as well as a Calculated Selling Price (with a predetermined profit margin) it is necessary to develop Predetermined Overhead Rates for operating expenses. As was the case with manufacturing overhead, a budgeted volume level must also be determined. However, the Volume Level units against which Operating Overhead Rates are calculated are nearly always in units of Sales Dollars.

Exhibits 9, 10, and 11 are Budget Worksheets that can be used in connection with Distribution, G&A, and Selling.

The determination of these Overhead Rates is done in a manner similar to that for Manufacturing Overhead.

(1) A Sales Budget is developed to determine Budgeted Sales Dollars

(2) A Cost Budget is developed to determine the Total Cost, the Total Variable Cost, and the Total Fixed Cost for each broad category of operating expenses (e.g. Distribution, Selling, Administrative).

(3) Then for each Operating Expense category overhead rates are calculated as follows:

$$\text{Total Ovhd Rates} = \frac{\text{Total Budgeted Cost}}{\text{Total Sales \$}}$$

$$\text{Fixed Ovhd Rates} = \frac{\text{Fixed Budgeted Cost}}{\text{Total Sales \$}}$$

$$\text{Variable Ovhd Rates} = \frac{\text{Variable Budgeted Cost}}{\text{Total Sales \$}}$$

(4) The Profit Margin (usually before Taxes and usually before any non-operating income or expense) must be determined by management for use in Calculated Selling Price calculations. (The proper way for determining this percentage is by developing a full Income Statement Budget - part of a Master Budget.)

(5) The above Overhead Rates and the Profit Rate are added together for a combined Overhead/Profit Rate (as a percentage of Sales $). This combined Rate is subtracted from 100 and the result is divided into 1000. The result less 100 is a new combined (Overhead Rate-TMC) which when multiplied by the Total Manufacturing Cost will provide the Operating Expense and Profit. The individual (Overhead Rates-TMC) can be determined by proportion, using the ratio of the individual (Overhead Rates-S) to the combined (Overhead Rates-S). These (Overhead Rates-TMC) are used on the Cost Sheet.

Note: S = based on Sales

TMC = based on Total Manufacturing Cost

C4.3 Calculated Selling Prices

The above costing rates make it possible to calculate a Total Cost (to make and sell) based on full absorption costing, as well as a Calculated Selling Price (using a budgeted or planned profit margin.)

The same data provides the basis for using Variable Costing to calculate the Total Variable Cost, Calculated Selling Price, and Total Cost to Make and Sell.

If only full absorption costing is used, Fixed and Variable can be combined for all overhead costing rates, insofar as costing is concerned. If Breakeven Analyses or other Cost/Volume/Profit analyses are desired, then the Fixed/Variable data must be retained.

It must be obvious that a Calculated Selling Price and an Actual Selling Price are seldom the same. The Actual Selling Price must be primarily determined by the marketplace, using the costing data as a guide to the range in which it is feasible from a cost point of view to set the price.

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D. COST MANAGEMENT

D1. Cost Management - An Overall View

D1.1 Concepts/Techniques of Cost Management

Cost Management in its simplest terms can be said to be the accumulation and analysis of cost data to assist management in operating a business. It implies planning and controlling costs. With respect to costs, planning looks to the future and control looks to the present. The fundamental aim of cost management is simply getting the best results for the lowest cost - by revealing waste and weakness in order to show where effectiveness must be improved.

However it is done, cost management is exercised to some degree in every viable enterprise.

Nearly all companies, small or large, are typically concerned with improving their cost management techniques. This is an essential aspect of the art of running a successful business.

Since some of the most useful concepts for effective cost management have developed in connection with the use of modern standard cost accounting and budgetary control systems, using variance analysis, standards and budgets, it should obviously be useful to gain an understanding of these subjects.

Some of the techniques available can advantageously be used to some degree by any size company. Hence, in the sections that follow some fundamental cost management techniques and concepts will be briefly discussed, including the following:

Budgetary Control

Variances and their Analysis

Material Cost Control

Labor Cost Control

D1.2 A Restatement of Key Points

Before discussing variance analysis and budgetary control, which are closely interrelated, it would be useful to restate some key points made in this manual in previous sections.

Standard costs and budgeted costs are both predetermined judgements of what costs should be, normally for attainable and reasonably efficient conditions.

The terms "Standard costs" and "budgeted costs" can often be used interchangeably. Some of the generally accepted distinctions between the two have been discussed.

Standard costs and budgeted costs are an essential part of a ledger-controlled standard cost accounting system, but it is possible to make effective use of standard costs and budgeted costs without having a standard cost accounting system. This also means that effective variance analysis and budgetary control can be achieved with or without a full-fledged standard cost accounting system. This fact is especially important for the smaller work glove company that may not be ready (for various reasons) for a complete standard cost accounting system, but must have standards and budgets for product pricing and effective cost management.

A full standard cost accounting system is often advantageous but not indispensable, and its operation will entail a significant operating cost and will require specialized personnel. On the other hand, when used as an adjunct to budgetary control management, it provides a very comprehensive, integrated cost management system. Another basic advantage it provides is that by using standard costs to flow through the accounts, it simplifies procedures that are used to value work-in-process inventory, finshed goods inventory and the cost of goods sold.

A main thesis of this cost manual is that all work glove companies, but especially the smaller company, must be able to predetermine the cost of its products for effective pricing. Also, the smaller company must also be able to control its costs effectively in today's competitive environment. The net consequence of this is that the smaller company, to be effective, must avail itself of standard and budgeted costs and must use the data not only for product costing but also for cost control, based on some form of variance analysis and budgetary control.

Another basic thesis of this manual is that in the broad area of product costing and cost management, many levels of sophistication and detail are possible. If the smaller company is able to appreciate this fact, it will be able to immediately improve its product costing and cost management functions without being deterred by its awareness that it is unable to achieve the more advanced systems that are available. From a cost-benefit perspective the company may in fact be better off without such advanced systems. Having reasonably effective product costing and cost management is more important than the trappings of an advanced cost accounting system, and the focus should be on the basic functions themselves. If there is a general awareness of some of the main levels of refinement, then the smaller company can gradually upgrade these functions as it grows and as its needs change. In line with this, the level of detail should always be determined by examining the potential benefits that are possible.

Thus, both for the short-run and the long-run the smaller work glove manufacturer will benefit from a better understanding of the fundamentals of Variance Analysis and Budgetary Control.

It is also worth recognizing that no system is without some weaknesses or complexities. As a matter of perspective, it is well to point out a few of the common problems and limitations that are encountered with a standard cost accounting system.

A standard cost accounting system requires more elaborate reports, accounting transactions and an expanded chart of accounts and record-keeping system as compared to a conventional accounting system.

Reliable standards are necessary both for a standard cost accounting system as well as for simpler systems that encompass product costing and reasonable cost control. In either case, getting such reliable standards involves significant cost and requires maintenance and specialized personnel.

A complete standard cost accounting system requires at least one specialized individual to control the accounting that is involved.

Projected costs for labor and material often have to be changed, and depending on the policies for the system, changes in standards must be made or, variances may be distorted and results must be carefully interpreted. Normally, one tries to avoid changes in standard in the middle of an accounting period.

Nowadays, for many situations, a computer is required to deal with all of the calculations required to prepare the data necessary to be entered into the standard cost accounting system.

Occasionally, to properly interpret variances, study must be made going back to original transactions and circumstances.

Standard Cost Systems, because of the large size and complexities of their integrated data base, that must tie in with other systems, at times develop inconsistencies that may require a significant amount of management effort for proper adjustment.

Nevertheless, when properly designed and implemented in a situation where the effort is justified, a standard cost accounting system combined with budgetary control can provide major benefits.

D1.3 Budgetary Control

There is a significant difference between budgeting and budgetary control. Budgeting is typically a once a year project (sometimes more often). Budgetary control is a continuing process, a management tool that can and should affect each day's operations.

Budgetary control will, if practiced in a practical and knowledgeable way, can significantly increase profit over what would be achieved if such a management technique were not followed.

The size of a company will often affect the kind of budgetary control used or needed. The less elaborate the organization of the company, the less varied the production processes, the more concentrated the sales area, etc, the simpler the budgetary control system will be.

The net benefit provided by a budgetary control system depends obviously on the benefits achieved and the cost of the budgetary control system. Further, no two systems are practiced alike -- unlimited variations are possible. Different managements have different degrees of commitment to the philosophy and practice of budgetary control. Different managements aim for different levels of detail.

In some companies, budgetary control means making a budget once a year (with varying degrees of care in making that budget) and then waiting to see at the end of the year how the actual compares with the budget. In other companies, elaborate and detailed variance reports are generated - some daily, some weekly, some monthly, some quarterly, some annually, and some for other periods, and these variance reports may be carefully studied by the individuals designated as having responsibility for all or some of the costs included on the report.

The basic concepts of full budgetary control are very simple: For each signficiant element of cost and revenue, a planned amount (a budgeted amount) is determined and then studied and given final review based on a master budget that will typically include an Income Statement Budget, and often will include a Balance Sheet and Cash Budget. One of the main purposes of the Master Budget is to make sure that each budgeted amount is consistent with all other budgeted amounts in of an overall plan.

Then, periodically, and at the end of the fiscal year, the Actual cost is reported and compared with the Budgeted cost. The difference is termed a Variance and may be favorable (by convention, a minus [-] variance) or unfavorable (by convention, a plus [+] variance).

As part of the principle of Management by Exception, each variance showing a significant amount (+ or -), is investigated to determine where remedial management action may be possible.

The interpretation of these Variances is known as Variance Analysis. Many refinements and subtleties are possible in this area, but only some of the most useful types of variance will be discussed here.

It is possible to use the Budgetary Control technique for very limited categories of cost (in this case, a Master Budget is not required) or it can be used in a comprehensive, all-encompassing way. Obviously, various degrees of use in between are possible.

Budgets are applicable to all categories of Overhead Cost, and included in this manual are illustrative Budget Worksheet forms that can be used as a guide but must be modified to cover all of the account categories that fit a particular situation.

These Budget Worksheets include:

Manufacturing Overhead	(Exhibit 8)
Distribution Overhead	(Exhibit 9)
General and Administrative Overhead	(Exhibit 10)
Selling Overhead	(Exhibit 11)

D2.1 Direct Material and Direct Labor Variances

A Variance is the difference between Actual Cost and Standard Cost. In the case of materials and labor, the Actual Cost and the Standard Cost are each calculated with two components: a Quantity multiplied by a Rate.

In the case of materials, a Cost is calculated by multiplying a Quantity using a unit of measure such as yards or pounds or units multiplied by a Price per unit of measure.

In the case of labor, a Cost is calculated by multiplying a Quantity of hours by a wage rate in dollars per hour.

Exhibit 9

BUDGET WORKSHEET - DISTRIBUTION OVERHEAD (Warehousing/Shipping)

Plant: Period Length: From: To:

Element of Cost	Budget			Last Year			
				Budget			Actual
	Total	Fixed	Variable	Total	Fixed	Variable	Total
Warehouse Labor							
Truck Driver Wages							
Overtime Premium							
Supervision							
Payroll Taxes							
Personnel Insur & Benefits							
Bonuses							
Shipping Supplies							
Freight Out							
Truck Maintenance							
Truck Oper Exp.							
Forklift Maintenance							
Rent							
Building Maintenance							
Heat							
Light & Power							
Depreciation - Equip							
Depreciation - Trucks							
Insurance							
Miscellaneous							
TOTALS							
Budgeted Sales							
Percentage							

BUDGET WORKSHEET - GENERAL AND ADMINISTRATIVE EXPENSES

Period Length: From: To:

Element of Cost	Budget			Last Year			
				Budget			Actual
	Total	Fixed	Variable	Total	Fixed	Variable	Total
Office Salaries							
Overtime Premium							
Supervision							
Executives							
Payroll Taxes							
Personnel Insur & Benefits							
Bonuses							
Office Supplies & Expenses							
Stationery and Printing							
Postage							
Dues & Subscriptions							
Telephone							
Rent							
Fuel							
Electricity							
Data Processing Rental							
Auto Maintenance							
Auto Expenses							
Travel & Entertainment							
Depreciation - Furn & Equi							
Depreciation - Auto							
Depr. Leasehold Improve.							
Insurance							
Miscellaneous							
TOTALS							
Budgeted Sales							
Percentage							

Exhibit 11

BUDGET WORKSHEET - SELLING OVERHEAD

Period Length: From: To:

Element of Cost	Budget			Last Year			
				Budget			Actual
	Total	Fixed	Variable	Total	Fixed	Variable	Total
Sales Office Salaries							
Overtime Premium							
Sales Salaries							
Sales Exec Salaries							
Payroll Taxes							
Personnel Insur & Benefits							
Bonuses							
Office Supplies & Expenses							
Telephone							
Sales Taxes							
Sample Expenses							
Advertising							
Promotion & Displays							
Auto Maintenance							
Auto Expenses							
Travel & Entertainment							
Credit & Collection Expens							
Bad Debts							
Rent							
Heat							
Electricity							
Insurance							
Depreciation - Auto							
Depreciation - Furn & Equi							
Miscellaneous							
TOTALS							
Budgeted Sales							
Percentage							

The Total Variance for Material is therefore calculated as follows:

Total Material Variance = (Act Qty x Act Price)-(Std Qty x Std Price)

However, there are two signficiant components to this Total Material Variance: a portion that is due to a change in price and a portion that is due to a change in quantity used. Also, when carefully analyzed, there is also a third component - a portion due to both a change in price and a change in quantity.

On the chart "Graphic Representation(1) of Direct Material Variances (3-Variances) this situation is clearly shown (on a so-called x-y axis).

Please note the following:

Pure price Variance = (Act Price - Std Price) x Std Qty

Pure usage Variance = (Act Qty - Std Qty) x Std Price

Joint Variance = (Act Price - Std Price) x (Act Qty - Std Qty)

As a practical matter such a 3-Variance approach, which is also applicable to Labor, is rarely used, and the joint variance is usually combined with either the Usage or the Price Variance. The most common practice is to combine the Joint Variance with the Price Variance. This approach simply reasons that the total Price Variance should be dealt with first (it occurs first in time) and the balance of the total variance should be the Usage Variance.

This approach is illustrated on the chart "Graphic Representation(2) of Direct Material Variances (2-Variances)" and shows how the total variance would be divided. Note that this representation is correct when the Actual Qty is the quantity used, and the Actual Price is the price of what is used.

Note the following:

Price Variance = (Act Price-Std Price) x Act Qty
(Actual based on "used")

Usage Variance = (Act Qty - Std Qty) x Std Price
(Actual based on "used")

The above is correct, but unfortunately it does not represent the most usual way of calculating Material Variances.

It is most usual (also most timely and convenient) for Price Variances to be based on what is purchased, and Usage Variances based on what is used. If what is purchased always represents what is used Representation(2) would hold. However, this is usually not the case, and this is illustrated in "Graphic Representation(3) of Direct Material Variances".

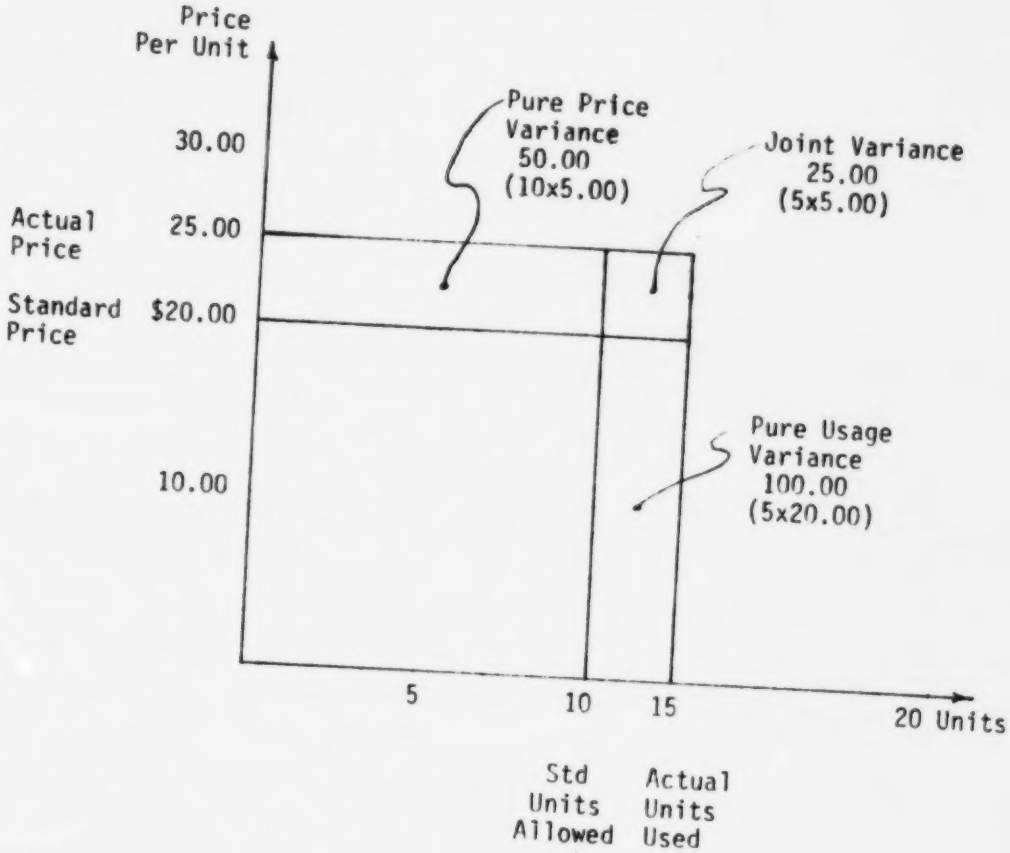
Note the following:

Purchase Price = (Act Price - Std Price) x Act Qty Purchased
Var (Based on Purchases)

Usage Variance = (Act Qty Used - Std Qty) x Std Price
(Based on Used)

The discontinuity between used quantity and purchased quantity is a difference in RM inventory, which in the long run may or may not cancel itself out. If all purchases are used, it will cancel itself out.

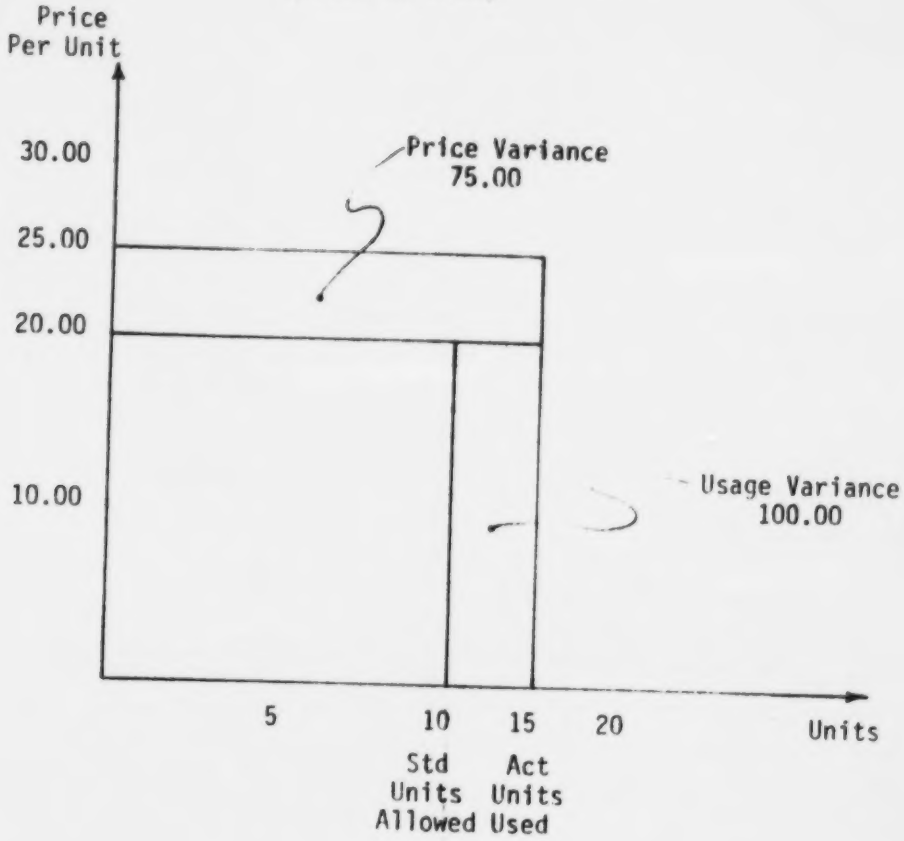
GRAPHIC REPRESENTATION (1)
OF
DIRECT MATERIAL VARIANCES (3-VARIANCES)
(Based on "used") (Using Data as Shown)



Total Variance = Pure Price V + Pure Usage V + Joint V
= +50.00 + (+25.00) + (+100.00) = +175.00U

Total Variance = Act Price x Act Qty - Std Price x Std Qty
= 15 x 25 - 20 x 10
= 375 - 200 = +175.00U

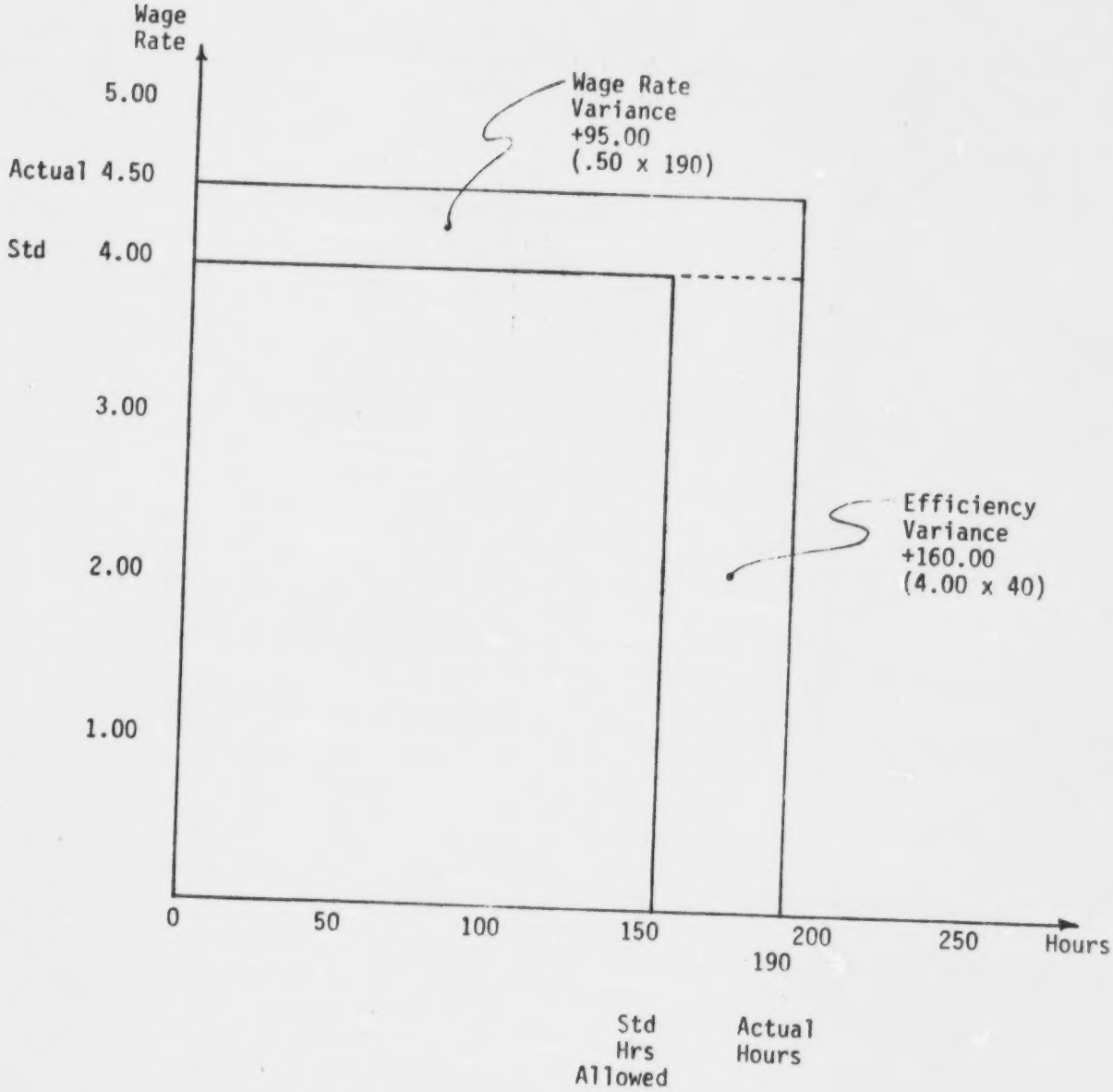
GRAPHIC REPRESENTATION (2)
OF
DIRECT MATERIAL VARIANCES (2-VARIANCES)
(Based on Used)



Total Materials Variance = Price V + Qty Var
= +75.00 (+100) = 175.00U
= Act Price x Act Qty - Std Price x Std Qty
= 15 x 25 = 20 x 10
= 375 - 200 = +175.00U

Exhibit 15

GRAPHIC REPRESENTATION
OF
DIRECT LABOR VARIANCES (2-VARIANCES
FOR DIRECT MATERIAL)



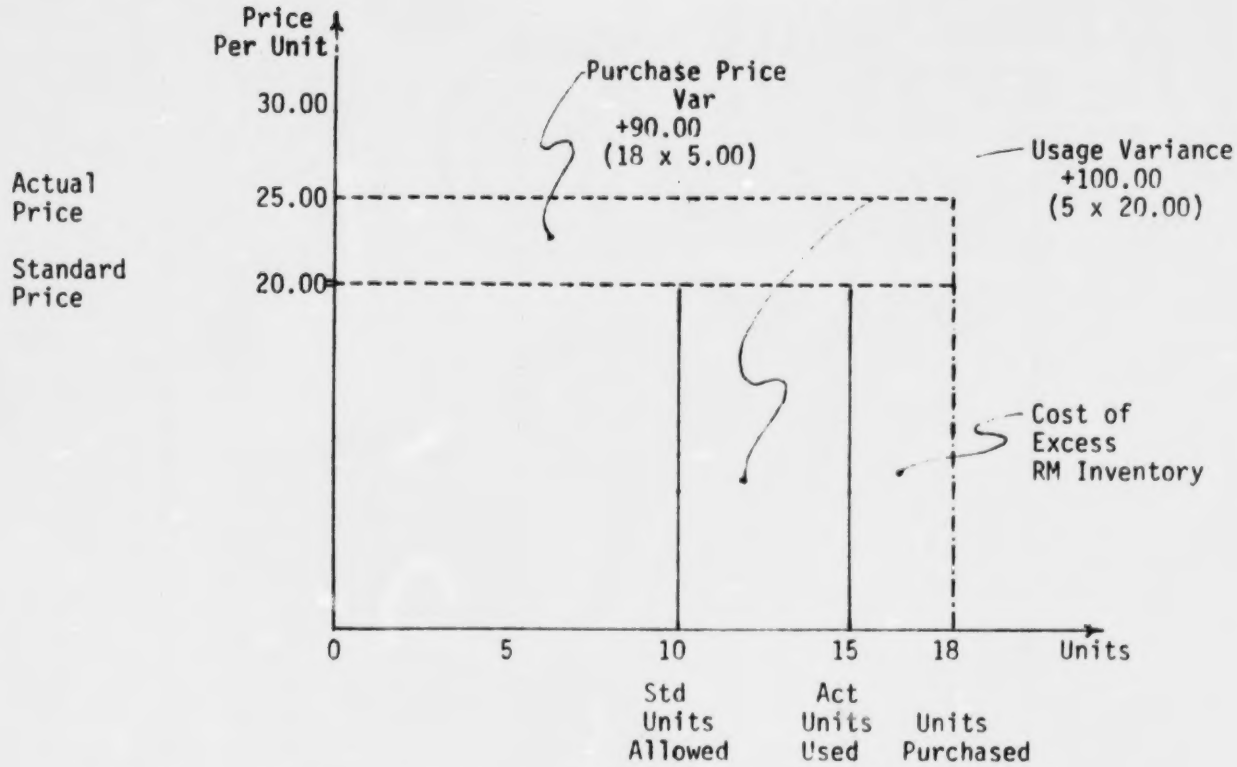
Total Labor Variance = (Actual Rate x Actual Hours)-(Std Rate x Std Hours)
= (4.50 x 190) - (4.00 x 150)
= 855 - 600 = +255U

Total Labor Variance = Rate Var + Eff Var
= +95.00 + (+160.00) = +255U

Exhibit 14

GRAPHIC REPRESENTATION (3)
OF
DIRECT MATERIAL VARIANCES
(PRICE VARIANCE BASED ON PURCHASED)
(USAGE VARIANCE BASED ON USED)

Assuming that 20 Units were purchased
and using other data as shown



Price Var - Purchases = Units Purch x (Actual Price - Standard Price)
= 18 x (25.00 - 20.00) =+90.00U

Usage Var = (Actual Units Used - Standard Units Used) x Std Price
= (15-10) x 20.00 = + 100.00U

Total Materials Variance = Price Var - Purch + Usage Var
(Version 2) = +90.00 + (+100.00) = +190.00U

Standard Cost for = (Act Units Purch - Act Units Used) x Std Price
Change in = (18-15) x 20.00 = 60.00
RM Inventory

Cost of Materials Purchased = 18 x 25.00 = 450.00

Standard Cost of Materials Used = Std Units Allowed x Std Price
= 10 x 20.00= 200.00

Total Materials Variance = +190.00

Added Cost to Increase RM Inventory = + 60.00

450.00

This last approach is most common. Both the Price Variance and the Usage Variance are significant; each is due to a distinctly different factor. The Price Variance is primarily the concern of the Purchasing Agent, whereas the Usage Variance is primarily the concern of the Factory Manager and the Factory Supervisors.

The total Labor Variance has two major components: Wage Rate Variance and Efficiency Variance. This is illustrated on the chart "Graphic Representation of Direct Labor Variances (2-Variances)". Note that this depiction has already removed the joint variance, with Wage Rate Variance being considered first, and then the balance being Efficiency Variance. This is a usual way of setting forth these two variances when they are used, but as is explained in Section B3.3, other approaches are frequently advantageous.

Note the following:

Wage Rate Variance = (Act Wage Rate - Std Wage Rate) x Act Hours

Efficiency Variance = (Act Hours - Std Hours) x Std Wage Rate

The significance of each of the two variances above is fairly obvious. Both are the responsibility of factory management. Wage Rate Variances typically occur when an employee is transferred from that individual's regular job. Efficiency variance occurs for a host of reasons such as overtime premium, payment for repairs, make-up, non-standard payments, etc. Hence, it is often referred to as an "Inefficiency Variance".

D2.2 Flexible Budget

In a modern standard cost system, a so-called flexible budget is used to make possible improved variance analysis, relative to Overhead Costs.

The flexible budget concept applies to budgeted overhead costs, where there is a fixed component and a variable component.

Consider the following example:

Manufacturing Overhead for a plant is budgeted as follows:

Fixed - $20,000

Variable - $1.30 per Direct Labor Hour

If the budgeted volume is 10,000 Dir Labor Hours, the the budgeted Variable Cost is $13,000 at the budgeted (or Standard) volume.

The Predetermined Overhead Rate is

$$\frac{20,000 + 13,000}{10,000} = \$3.30 \text{ per Dir Lab Hour}$$

of which $2.00 per DLH is for Fixed Overhead

and $1.30 per DLH is for Variable

Now suppose the actual volume at the end of the accounting period were 12,000. What would the budget have been at this volume?

The answer is, of course, the following:

Fixed ----------	$20,000
Variable - $1.30 per Dir Lab Hrs x 12,000 =	$15,600
	$35,600

Thus, at 12,000 DL Hours, total Budgeted Overhead is 35,600

at 10,000 DL Hours, total Budgeted Overhead is 33,000 etc.

To get the Budgeted Overhead value for any volume level, we can either set up a table of values, or we can use the following formula:

Flexible Budget Total for a particular volume = Fixed Cost + Variable Cost per unit of volume x Units of Volume.

The advantage of having a flexible budget vs. a fixed or static budget, is that the latter does not properly account for changes in output (actual output relative to standard output). A variance with a static budget might, for example, be taken as an example of excess spending (where actual dollars exceeded budget). In actual fact, the increase of actual over budget (at standard volume) might be fully justified by the increase in volume. The flexible budget provides the budgeted amount at the actual volume, as will be seen in the explanation of overhead variance that follows.

D2.3 Manufacturing Overhead Variances

There are a number of different approaches normally taken for calculating overhead variances, depending on what degree of refinement one deems desirable. There are three common approaches that should be mentioned:

First Approach

Only the total variance is calculated, namely the total under or over applied or absorbed overhead.

Total Variance = Actual Mfg Overhead - Total Applied for the Standard Direct Labor Hours

(assuming that Standard Direct Labor Hours are the volume denominator of the Predetermined Overhead Rate)

Second Approach

The total variance is calculated as in the First Approach, but two components of the total are differentiated: a Budget Variance and a Volume Variance. For this differentiation the Flexible Budget (previously explained) is required.

The Budget Variance (or Flexible Budget Variance) is that portion of the total variance which is the difference between the Actual Cost incurred and the budget cost that should have been incurred (which is the Flexible Budget value for the Standard Direct Labor Hours allowed or calculated for the actual production).

Budget Variance = Actual Mfg Ovhd - Flex Budget Mfg Ovhd*
*(based on allowed standard direct labor hours)

In effect, this variance tells us to what extent we have gone over or under budget, excluding volume as a factor.

The Volume Variance is that portion of the total variance which is accounted for by the difference between the actual product volume and the expected (budgeted or standard) production volume used in applying the predetermined overhead rate.

Volume affects the fixed portion of the manufacturing overhead, not the variable portion.

One method for calculating the volume variance is as follows:

Volume Variances = (Standard Dir L Hours allowed for Actual Vol - Standard Dir L Hours allowed for budgeted volume) x Fixed Overhead Rate

(Note: The Predetermined Overhead Rate is composed of two elements: A variable Overhead rate and a fixed overhead rate.)

Another method for calculating the volume variance which gives the same result is the following:

Volume Variance = Flex Budgeted Mfg Ovhd for Std DLH allowed for production - Standard Mfg Ovhd applied to the Standard DLH allowed for production

It should be noted that the Variance Analysis approach using the two components above (Budget and Volume) is widely used. The Volume Variance is occasionally referred to as the Fixed Overhead Volume Variance.

Third Approach

The total variance is calculated as in the First Approach, but three components of the total are differentiated: A Spending Variance, a Variable Overhead Efficiency Variance, and the Volume Overhead Variance which was described in the Second Approach. The sum of the first two of the three variances mentioned here is exactly equal to the Budget Variance. Hence, the Third Approach merely refines the Budget Variance, by differentiating two components of it.

The Spending Variance is in effect a budget variance, but one that limits itself to determining the difference between the Actual Manufacturing overhead and the overhead cost that should have been incurred for the actual DLH.

The Variable Overhead Efficiency Variance, which is the balance of the Budget Variance, shows the amount of variable overhead that has been lost or saved, depending on whether the actual direct labor hours are more or less than the standard direct labor hours allowed ("earned") for the actual production.

The formulas for these Variances are as follows:

Budget Variance* = Spending Variance + Variable Efficiency Variance
*(Formula given in Second Approach)

Spending Variance = Actual Mfg Ovhd - Flexible Budgeted Mfg Ovhd for actual hours used in production

Variable Overhead Efficiency Variance = Flexible Budgeted Mfg Ovhd for Standard hours allowed for production - Standard Mfg Ovhd applied to the standard hours allowed for production.

The Volume Variance is frequently referred to as the Fixed Overhead Volume Variance. One of the two ways of calculating this variance is by use of the Fixed Overhead Rate, as indicated in the Second Approach.

Similarly, the Efficiency Variance is frequently referred to as the Variable Overhead Efficiency Variance, and a second way for calculating this variance involves the Variable Overhead Rate as follows:

Variable Overhead Efficiency Variance = (Standard DLH allowed for production - Actual DLH) x Variable Overhead Rate

See Exhibit 17 for a Summary of the Various types of Manufacturing Overhead Variances. These same Variances are graphically illustrated on Exhibit 16.

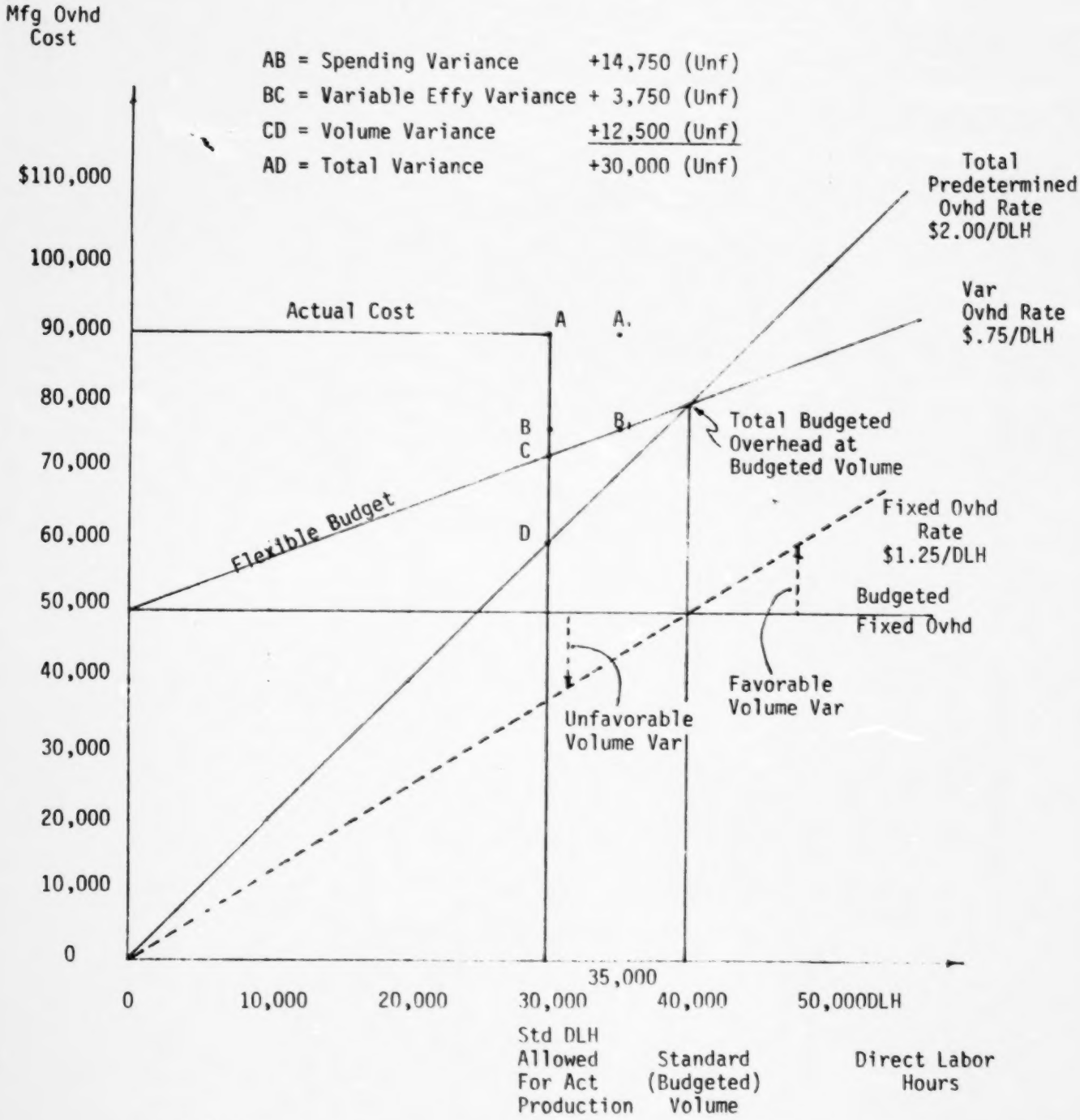
See Exhibits 18 and 19 for a convenient summary of most of the important cost Variances.

Variable and Unfavorable Overhead Variances

The example used to describe the various kinds of overhead variances shows all variances as being unfavorable, since it makes the graphical representation much more clear. Nevertheless, in the Second and Third Approach, the component variances could be any combination of favorable and unfavorable, and if calculated correctly, the algebraic sum must equal the total variance. (By convention, the variance formulas yield a plus value for an unfavorable standard, and a minus value for a favorable standard).

Exhibit 16

GRAPHICAL REPRESENTATION OF
MANUFACTURING OVERHEAD VARIANCES



A = 90,000
B = 76,250 35,000 DLH Actually Used in Production
C = 72,500 30,000 Std DLH Allowed ("Earned") for Actual Production
D = 60,000 40,000 DLH - Estimated or Budgeted Volume

ILLUSTRATIVE EXAMPLES OF MANUFACTURING OVERHEAD VARIANCES

Based on the Following Data for Manufacturing Overhead:

Fixed Mfg Ovhd = $50,000
Variable Mfg Ovhd = $0.75 per DLH (Direct Labor Hour)
Budget Volume = 40,000 DLH

Predetermined Overhead Rate $= \frac{50,000 + (.75 \times 40,000)}{40,000} = \frac{50,000 + 30,000}{40,000} = \$2.00$ per DLH

of which $1.25 per DLH is for Fixed and $.75 per DLH is for Variable

Actual DLH - actually used in Production ---------- 35,000 DLH
Standard DLH allowed for Actual Production --------- 30,000 DLH

	Fixed	Variable	Total				
Actual Mfg Ovhd	----------→		90,000	A	+14,750U Spending Var	Budget Var +18,500U	Total Variance +30,000U
Flex Budg Mfg Ovhd for 35,000 DLH	50,000	26,250	76,250	B	Variable Effy Var +3,750U		
Flex Budg Mfg Ovhd for 30,000 DLH	50,000	22,500	72,500	C	Volume Var +12,500U		
Applied Mfg Ovhd for 30,000 DLH	37,500	22,500	60,000	D			

Exhibit 17

COMMONLY USED COST VARIANCES

Cost Category	Description of Variance	Method of Calculation (+ Variances are Unfavorable)(U) (- Variances are Favorable)(F)
Direct Labor Cost	Total Variance	Actual Labor - Standard Labor (Act Hrs x Act Rate) - (Std Hours x Standard Rate)
Direct Labor Cost	Wage Rate (or "Price of Labor") Variance	(Act Rate - Standard Rate) x Actual Hours Worked (Difference in Rate)
Direct Labor Cost	Efficiency (in the Usage of Labor) Variance	(Act Hours - Std Hours) x Standard Rate (Difference in Hours)
Direct Material[1] Cost	Total Variance	Actual Cost - Standard Cost = (Act Qty x Act Unit Cost) -(Std Qty x Std Unit Cst)
Direct Material[1] Cost	Price Variance	(Act Unit Cost - Std Unit Cost) x Act Units Used (Difference in Unit Cost)
Direct Material[1] Cost	Usage (or Efficiency in the usage of material) Variance	(Act Quantity - Std Quantity) x Std Unit Cost (Difference in Quantity)
Manufacturing[2] Overhead	Total Variance [(A)+(B)+(C)]	Actual Mfg Ovhd - Std Mfg Ovhd Applied to the Std Hours allowed for Actual Production
Manufacturing[2] Overhead	Spending Variance (A)	Actual Mfg Ovhd - (Flex) Budgeted Mfg Ovhd for actual hours used in production
Manufacturing[2] Overhead	Efficiency Variance (B) (or variable ovhd efficiency variance)	(Flex) Budgeted Mfg Ovhd for act hours used in Prod - (Flex) Budgetd Mfg Ovhd for Std Hours allowed for Production
Manufacturing[2] Overhead	Budget Variance [(A)+(B)] (or flexible budget variance)	Act Mfg Ovhd - (Flex) Budgeted Mfg Ovhd for Std Hours allowed for production
Manufacturing[2] Overhead	Volume Variance (C) (or fixed ovhd volume var)	(Flex) Budgeted Mfg Ovhd for Std Hrs allowed for Prod - Std Mfg Ovhd applied to the Std Hrs allowed for Prod

[1] All variances here assumed to be for quantities used. See main text for explanation of Price Variances based on purchases, which is often used.

[2] Volume units assumed to be D.L. Hours, but $, machine-hours, etc. could be substituted.

ADDITIONAL VARIANCES

Cost or Revenue Category	Description of Variance	Method of Calculation (+Variances are Unfavorable) (-Variances are Favorable)
Sales	Sales Price Variance	(Std Price - Act Price) x Actual Qty Sold
Mfg Ovhd		Calculations Using Actual Var Ovhd Rate = Act VR Standard Var Ovhd Rate = Std VR Actual Fixed Ovhd Rate = Act FR Standard Fixed Ovhd Rate = Std FR Actual Hours Used in Prod = Act H Std Hours allowed for Prod = Std H Expected or Budgeted Hrs = Budg H
	Total Var Ovhd Variance	(Act VR x Act H) - (Std VR x Std H) (Act Var Ovhd) - (Applied Var Ovhd)
	Var Ovhd Budget Variance	Act VR x Act H - Std VR x Act H (Act Var Ovhd) - (Flex Budgeted Var Ovhd)
	Var Ovhd Effcy Variance	Std VR x Act H - Std VR x Std H (Flex Budgeted Var Ovhd) - (Applied Var Ovhd)
	Total Fixed Ovhd Variance	Act Fixed Ovhd - (Std FR x Std H) (Act Fixed Ovhd) - (Applied Fixed Ovhd)
	Fixed Ovhd Budget Variance	Act Fixed Ovhd - Std FR x Budg H (Act Fixed Ovhd) - (Budgeted Fixed Ovhd)
	Fixed Ovhd Volume Variance	Std FR x Budg H - Std FR x Std Hrs (Budg Fixed Ovhd) - (Applied Fixed Ovhd)

As an example, using the Second Approach, there might be an instance where the total variance is say 3,000 (favorable). However, this total variance might be composed of a Budget Variance of +22,000 (unfavorable) and a Volume Variance of -25,000 (Favorable). This simply means there may have been serious overspending, but this was bailed out by higher than expected volume. Although the total variance might be modestly favorable, the budget variance factors (spending and variable efficiency) would have to be scrutinized carefully for improvement.

The above example illustrates the advantage of a Flexible Budget, which provides an overhead budget that varies as production varies, and makes it possible to calculate a Budget and Volume Variance.

A primary purpose of Standards and Budgets is to be able to compare costs with Actual and develop Variances, so that management can monitor its weaknesses and strengths. The calculation of variances in such a way that interpretation of those variances is made easier, obviously aids the entire process of cost management. Use of variances is a means of "managing by exception", which is common-sense, time-saving approach, that focuses most effort and time on problem areas. These problem areas are identified by those variances that are significantly large.

To have the variances result in improvement, responsibility has to be assigned, and variance reports should be so designed as to provide the person responsible with the variances controlled by that person. This approach is facilitated by such means as the establishment of Responsibility Centers and a clear statement of responsibilities on organizational Job Descriptions. However, even where a company is small, and such refinements as Responsibility Centers and formal Job Descriptions are considered to be "frills" or "luxuries" best left to larger companies with greater resources, it is crucial that cost and variance responsibility be clearly understood.

In a cost management system, the ultimate goal is not calculating and reporting variances, but rather the management action aimed at improvement that results from monitoring these variances.

Note: Exhibits 20, 21, 22, 23, 24, and 27 which follow, illustrate one useful format for a Variance Report.

D2.4 Other Variances

The more common variances for Direct Labor, Direct Material and Manufacturing Overhead have been discussed. Most importantly, the fundamental variance concept has been explained in some of its most basic forms.

Exhibit 20

VARIANCE REPORT - MANUFACTURING OVERHEAD

Plant: Period Length: From: To:

Element of Cost	Current Period			Year to Date		
	Std Budget or Flex Budget	Actual	Variance	Std Budget or Flex Budget	Actual	Variance
Dir Labor Payroll Taxes						
Personnel Insur & Benefits						
Holidays & Vacations						
Plant Supervision						
Dept. Supervision						
Dept. Indirect Labor						
Receiving Dept. Costs						
Janitorial & Custodial						
Plant Mat'l Handling						
Auto/Truck Drivers						
Ind. Labor Payroll Taxes						
Personnel Insur & Benefits						
Holidays & Vacations						
Overtime Premium						
Bonuses						
Factory Supplies						
Repairs - Outside Contractors						
Rent						
Fuel						
Electricity						
Insurance						
Auto/Truck Maintenance						
Auto/Truck Oper Expenses						
Tools & Dies						
Depreciation - Equipment						
Depreciation - Building						
Depreciation - Auto/Truck						
Totals						
Total Mfg Ovhd Applied						
Mfg Overhd - Spending Variance	-	-		-	-	
- Volume Variance	-	-		-	-	
- Total Variance	-	-		-	-	

Exhibit 21

VARIANCE REPORT - DISTRIBUTION OVERHEAD (Warehousing/Shipping)

Plant: Period Length: From: To:

Element of Cost	Current Period			Year to Date		
	Budget	Actual	Variance	Budget	Actual	Variance
Warehouse Labor						
Truck Driver Wages						
Overtime Premium						
Supervision						
Payroll Taxes						
Personnel Insur & Benefits						
Bonuses						
Shipping Supplies						
Freight Out						
Truck Maintenance						
Truck Oper Expenses						
Forklift Maintenance						
Rent						
Building Maintenance						
Heat						
Light & Power						
Depreciation - Equipment						
Depreciation - Trucks						
Insurance						
Miscellaneous						
TOTALS						

Exhibit 22

VARIANCE REPORT - GENERAL AND ADMINISTRATIVE EXPENSES

Period Length: From: To:

Element of Cost	Current Period			Year to Date		
	Budget	Actual	Variance	Budget	Actual	Variance
Office Salaries						
Overtime Premium						
Supervision						
Executives						
Payroll Taxes						
Personnel Insur & Benefits						
Bonuses						
Office Supplies & Expenses						
Stationery and Printing						
Postage						
Dues & Subscriptions						
Telephone						
Rent						
Fuel						
Electricity						
Data Processing Rental						
Auto Maintenance						
Auto Expenses						
Travel & Entertainment						
Depreciation - Furn & Equipment						
Depreciation - Auto						
Depreciation - Leasehold Improve.						
Insurance						
Miscellaneous						
TOTALS						

VARIANCE REPORT - SELLING OVERHEAD

Period Length: From: To:

Element of Cost	Current Period			Year to Date		
	Budget	Actual	Variance	Budget	Actual	Variance
Sales Office Salaries						
Overtime Premium						
Sales Salaries						
Sales Exec. Salaries						
Payroll Taxes						
Personnel Insur & Benefits						
Bonuses						
Office Supplies & Expenses						
Telephone						
Sales Taxes						
Sample Expenses						
Advertising						
Promotion & Displays						
Auto Maintenance						
Auto Expenses						
Travel & Entertainment						
Credit & Collection Expenses						
Bad Debts						
Rent						
Heat						
Electricity						
Insurance						
Depreciation - Auto						
Depreciation - Furn & Equip						
Miscellaneous						

Exhibit 24

VARIANCE REPORT - MATERIALS

Plant: All Period Length: From: To:

Element of Cost	Current Period			Year to Date		
	Budget	Actual	Variance	Budget	Actual	Variance
Purchase Price Variances						
Raw Materials						
Freight-In						
Packing Materials						
Finished Gloves						
Total Purchase Price Variances						
Material Usage Variances						
Cutting - Plant 1						
Cutting - Plant 2						
Yarn - Plant 1						
Yarn - Plant 2						
Wristing, etc. - Plant 1						
Wristing, etc. - Plant 2						
Packing Materials - Plant 1						
Packing Materials - Plant 2						
Total Material Usage Variances						
TOTALS						

Exhibit 27

VARIANCE REPORT - DIRECT LABOR

Plant: Period Length: From: To:

Element of Cost	Current Period			Year to Date		
	Budget	Actual	Variance	Budget	Actual	Variance
Department A						
Measured or Incentive						
Addt'l Costs Incl in Cost Ratio						
Other Labor						
Department B						
Measured or Incentive						
Addt'l Costs Incl in Cost Ratio						
Other Labor						
Department C						
Measured or Incentive						
Addt'l Costs Incl in Cost Ratio						
Other Labor						
Department D						
Measured or Incentive						
Addt'l Costs Incl in Cost Ratio						
Other Labor						
Department E						
Measured or Incentive						
Addt'l Costs Incl in Cost Ratio						
Other Labor						
Department F						
Total Direct Labor						
Department G						
Total Direct Labor						
TOTALS						

However, the variance principle is so general that there are any number of kinds of variance that can be conceived, and any element of a Balance Sheet and an Income (P&L) Statement can be budgeted and variances calculated.

In the two sections which follow - Direct Material Cost Control and Direct Labor Cost Control - there is further discussion of variances and related cost control techniques.

Overhead other than Manufacturing (namely Distribution, Warehouse and Shipping, Selling, and General and Administrative) can be analyzed in ways similar to that used with Manufacturing Overhead.

The most usual variances used for these expenses are the Total Variance, broken down into two component Variances - the Budget Variance (sometimes referred to as the Spending Variance) and the Volume Variance.

Variance analysis is also used for Sales. (Formulas are set up so that + Variances are unfavorble, and - Variances are Favorable). A total Sales Variance is used and three components are Sales Volume (or Quantity) Variance, Sales Price Variance, and Sales Mix Variance.

Another alternative to overhead variances is the use of variances such as 2 variable overhead variances (Budget and Efficiency) and 2 fixed overhead variances (Budget and Volume) and further refinements exist. This compares to the Third Approach as follows:

The Variable Efficiency and the Fixed Overhead Volume Variances are the same as used for the Third Approach. However, in the 4-Variance approach, the Budget Variance of the Third Approach is subdivided into two categories: Variable Overhead Budget Variance and Fixed Overhead Budget Variance. This approach is very logical. It requires that the Actual Overhead be divided into two parts: Actual Fixed and Actual Variable. This is not required by the 3-Variance approach (Third Approach).

The fact that additional variance definitions and refinements are available is mentioned here only as a matter of perspective. For those interested, details can be found in books on cost accounting. For a small manufacturer who has previously done little with Variance Analysis, the process can be gradual. Direct Labor and Direct Material should receive first priority.

As one develops experience and interest in Variance Analysis, the desire for more refined analysis and more detailed variances will develop.

Among the fundamental questions that have to be asked for all variances generally are:

What constitutes a signficant variance amount? What total dollar amount? What percentage of the total?

Is the element of cost one that is subject to random fluctuation and if so, does the variance amount fall within the acceptable range of random fluctuations? Can this range be defined?

Is the significant variance due to an abnormal circumstance which occurred during the period? Or is it possible that the budgeted amount (or standard) was inaccurately determined, and that new insight has been gained for the preparation of the next budget? Or are there errors or weaknesses in the company's operations? If so, can they be identified?

Was the budget based on what is currently attainable under reasonably efficient operating conditions, or was some other definition used? (Variances depend on performance and circumstances, the definition of budget conditions and the accuracy in determining the budget).

Are the variances possibly miscalculated either because of an error in accumulation or calculation, or because of a weakness in the cost system? Is record-keeping disciplined and controlled for accuracy? Are cross checks made?

Finally, what action ought to be taken so that a particular problem situation can be improved or solved?

The purpose of Variances is to reveal situations that require managerial attention aimed at improvement. The purpose of Managers is to provide that attention.

D.3 Other Relevant Techniques of Cost Control

D3.1 General Considerations - Materials & Labor Cost Control

The principle of variances is applicable to all elements of cost (and revenue) but in terms of the operation of a cost system (in its broadest sense) there is a very important difference between direct material and direct labor as against all types of overhead cost. The incurrence of material and labor (in the work glove industry) is highly dynamic and the two elements of cost in combination represent typically more than 50% of the selling cost. Material and labor costs must be monitored monthly and weekly, but in a well-managed operation must also be monitored weekly, daily, and hourly.

Overhead costs on the other hand can be monitored in the overall, on a less frequent basis, even though it is obvious that the incurrence of certain overhead costs must be monitored as these costs occur. Nevertheless, in all groups of overhead costs there are large portions of fixed cost (where cost decisions are made on a relatively infrequent basis) and even the variable expenses are generally incurred in a less dynamic way than direct material and direct labor.

Each material purchase has a variance associated with it. Each material cutting or other use has a variance associated with it. Each labor operation done by each employee has a variance associated with it, and more detail is required than just an efficiency and rate variance. With labor, the rate variance is usually of minor importance compared with the efficiency variance. However, the efficiency variance (valuable though it is especially when expressed as a %) is not enough for effective cost control, especially when most operations are on incentive.

Given these conditions, a 4-4-5 week or monthly Variance report often works well with Overhead Costs, especially if overhead invoices and/or disbursements are monitored as they occur, and indirect payroll is monitored weekly. However, for direct

material and direct labor a more frequent, more detailed approach is required. The variance principle (difference between actual and standard) remains useful but the kind of reporting, the degree of detail, and the frequency, are significantly different from overhead variance reports. Although a Summary Variance Report is usefully prepared for direct material and direct labor for the same period for which Overhead is reported, the primary cost management of material and labor should have taken place each day and each week. The summary variance report simply becomes a longer-range, upper management view for secondary or follow-up control.

D3.2 Direct Material Cost Control

As every work glove manufacturer knows, material cost is the largest single category of cost in the total cost of the work glove. Hence, considerable effort is justified in controls designed to assist in holding actual costs as close to standard as possible.

What is also obvious is that even before purchases and usage take place, considerable effort is worthwhile in searching for sources that can provide material at the lowest available cost so as to be able to realistically use as low a standard price as possible.

Moreover, the material specifications that relate to a particular price quotation must be carefully determined and checked. Certain material specifications have a direct bearing on usage: Narrow width goods will normally give a poorer yield than wider goods. Usually the best yield is obtained with the widest available width that is feasible to cut with modern die cutting equipment. Also, the frequency of defects in material obviously affects usage. Other material characteristics may affect the efficiency of certain operations as well as the quality of the end product.

The extent to which actual prices differ from standard prices (price variances) should be carefully monitored, and when significant unfavorable variance occurs, product costs and prices have to be checked. The point at which price variances are calculated has to be determined. The most common choices are "when purchased" and "when used" (Another possibility is when scheduled).

Price Variance

Checking price variances at the time of purchase (or receipt of purchases or receipt of invoice) is probably the most commonly used method, since it provides information at the earliest point in time, and is the simplest way in many respects. It would probably be a sound approach in most situations in the work glove industry.

With this approach, for each purchase, the purchase price variance is calculated. If done by a computer, the Standard Price for a material is stored in the Part No. file. Each Purchase Order (or Receipt or Invoice) is entered into the system daily. Then there may be from the computer a Daily Report of Purchases (or Receipts) showing price variances for each purchase and a total variance. A less frequent Summary Report would also be generated, giving for each Part No. (material), the current period and year-to-date Price Variances and Percentages. (One example of this type of report is shown in Exhibit 25 - Purchase Cost Analysis). Such a summary report will typically furnish totals, often broken down by material category. Perusal of these reports can provide a timely awareness of all signficant price variances. The period totals from these reports can be used to post an Operating Summary Report.

Usage Variances

Most companies check usage variances to some degree, without necessarily using the words "usage variances". A more usual term is Gains and Losses. Material yield per style is a major element in product costing, and it is absolutely essential that reliable data be available.

CARD NO.

IN 1

OUT 2

IN 3

OUT 4

JOB CLOCK TIME

FOR OFFICE USE ONLY

STYLE NO.

SHEET NO.

CUTTING CARD

CALL NO.

OP LIST NO.

DAYSHEET DATE

LOT NO.

SHEET NO. LINE NO.

CASES IN LOT

CASE NOS

REF. NO

ORDER NO.

DESC.

PLANNED DESTINATION CUTTING

MAT NO.

ALLOWED/CASE UM

MATERIAL DESCRIPTION

ISSUED TOTAL

LOT NO(S) & VENDOR

IF ANY SUBSTITUTION IS MADE ON MAT NO. ABOVE, INDICATE FOLLOWING

SUBSTITUTE MAT NO.

LOT NO.

AMT USED

REASON FOR SUBSTITUTION & MAT'L DESCRIP

PART

DIE NO.

ADDITIONAL TOTAL

RETURNED TOTAL

USED

ALLOWED FOR LOT (BEFORE SIZE ADJUST)

SPECIAL CUTTING INSTRUCTIONS

CUTTER'S NAME

CLOCK NO.

ALLOWED FOR LOT (ADJ. FOR SIZE)

CALC. MID-SIZE

ADJ. PER SIZE (%)

SUPERV. INITIALS

PLANT

DATE

GAIN OR LOSS

Exhibit 25

DATE 10/14/91 (91198) START DATE 80233

REPORT NO. 32 - PURCHASE COST ANALYSIS

PART NUMBER	DESCRIPTION	UM	STAND. COST	AVERAGE UNIT COST	LATEST UNIT COST	ACTUAL-COST-TO-DATE CLOSED P.O.	ACTUAL-COST-TO-DATE OPEN P.O.	% VARIANCE FROM STAND.	RATIO
02 021A	GLOVE BLACK	FT	1.430	1.480	1.480	13.534.600	.000	731.600-	106
02 023B	GLOVE BONE	FT	1.600	1.600	1.600	17.315.200	16.000.000	4.576.700	87
02 025A	GLOVE RED	FT	1.650	1.650	1.650	1.650	.000	.000	100
02 0614	ELEGANTE BLACK	FT	1.500	.000	.000	.000	.000	.000	0
02 062A	ELEGANTE WHITE	FT	1.500	1.500	1.500	6.772.500	.000	.000	100
02 063B	ELEGANTE BONE	FT	1.500	1.500	1.500	7.240.500	.000	.000	100
02 063D	ELEGANTE CAMEL	FT	1.500	1.500	1.500	.000	7.500.000	.000	100
02 0630	HARNESS CAMEL (SPORTY WHISKEY)	FT	1.700	1.643	1.700	16.187.400	.000	917.940-	106
02 063G	HARNESS CORONADO MAHG (SPORTY)	FT	1.720	1.990	1.990	7.080.420	.000	2.810.920-	166
02 0612	DEERSKIN BLACK (TOGGLED)	FT	2.250	2.094	2.250	68.936.250	.000	408.250-	101
02 0612T	DEERSKIN BLK/BLK CAMBRELLE	FT	3.030	2.832	3.020	8.894.460	.000	.000	100
02 0614	DEERSKIN BLACK/BLK CAMBRELLE	FT	3.030	.000	.000	.000	.000	.000	0
02 062A	DEERSKIN WHITE	FT	2.450	2.450	2.450	41.431.950	.000	.000	100
02 063B	DEERSKIN BONE	FT	2.250	2.120	2.250	22.106.000	.000	1.250.000-	106
02 063C	DEERSKIN TIFFANY	FT	2.000	2.000	2.000	7.764.000	.000	.000	100
02 063D	DEERSKIN SADDLE	FT	2.250	2.145	2.250	24.679.650	.000	.000	100
02 063E	DEERSKIN ACORN	FT	2.250	2.232	2.250	32.285.120	.000	.000	100
02 063E7	DEERSKIN ACORN/BRANDY CAMBRELLE	FT	3.030	2.930	3.030	16.728.155	4.296.540	27.300	100
02 063F	DEERSKIN MOONSADDLE	FT	2.250	2.154	2.250	17.265.170	.000	.000	100
02 063F7	DEERSKIN MOONSADDLE/MAXIBRN CAMB	FT	3.030	2.910	3.020	7.445.405	.000	32.445	100
02 064A	DEERSKIN NAVY	FT	1.900	1.900	1.900	12.629.300	.000	.000	100
02 093B	HILITE LP BONE	FT	1.530	1.520	1.520	9.671.120	.000	.000	100
02 093D	HILITE LP CAMEL (BAMBOO)	FT	1.530	1.503	1.560	72.626.120	.000	1.030.500	99
02 093G	HILITE LP BROWN	FT	1.560	1.180	1.180	6.320.080	.000	.000	100
02 094A	HILITE LP NAVY	FT	1.530	1.680	1.680	9.854.680	.000	.000	100
02 121A	CRUSHED LEA BLACK	FT	1.680	1.680	1.680	8.835.520	.000	.000	100
02 122E	CRUSHED LEA OATS	FT	1.610	1.610	1.610	15.740.970	.000	.000	100
02 125D	CRUSHED PINK	FT	1.550	1.457	1.500	10.127.500	.000	815.940-	109
02 152A	VICTORIA WHITE L.R.	FT	1.700	1.700	1.700	3.836.900	.000	.000	100
02 203F	MOONDANCE BROWN	FT	1.700	1.700	1.700	27.072.500	5.023.500	.000	100
02 203M	MOONDANCE TAUPE	FT	1.700	1.700	1.700	20.719.600	3.400.000	.000	100

Exhibit 26

In any well-managed cutting, knitting or other production situation, production output should be routinely recorded against the amount of material used. Where there is raw material warehouse control, the amount of material issued for a production lot and the amount of material returned are carefully controlled. The difference between the amount issued and the amount returned is the amount used. The amount allowed is the production quantity multiplied by the standard used on the product cost sheet. The difference between the amount used and the amount allowed is the Gain or Loss (-Variance or +Variance). Exhibit 22 is a Cutting Card form (from a related industry) which illustrates the type of information that may be useful. This particular card is printed by a computer just before the lot is scheduled, with all the information known at scheduling time. The card is sent to the Raw Material warehouse and then to cutting, and entries are made as required. When cutting is complete, the card is returned to the office, some of the newly recorded data is entered into the computer, and a Gain/Loss Report is generated showing gains/losses for each material, for each style, and for each cutter. The gains/losses are automatically entered as adjustments to the Available Stock for each material. This type of Usage Variance report provides control on a timely basis; daily or weekly. The Cutting Cards reveal variances as soon as a job is completed.

D3.3 Direct Labor Cost Control

In a labor intensive industry such as work gloves, direct labor variances need constant attention. However, a Variance Report each 4 or 5 weeks is entirely inadequate for effective control; it is only of value as an historical summary record of performance and to provide a longer-term view. Labor Variance and labor performance information have to be generated on a timely basis - not less frequently than weekly and some labor data should be provided daily. This is true whether payroll and labor cost analyses are done by computer or manually.

Variances and Product Costing presuppose Standards, and if Standards for most direct labor operations are available, they are normally used as the basis for an incentive plan, either Piece Rate or Standard Hours or Minutes or some other Bonus plan. This apparently is the situation in the work glove industry. With a properly designed incentive payroll recording system, Variances and related information can be generated as a by-product of the payroll.

Further, the conventional Labor variances are Rate and Efficiency, and each has its own significance. However, for work glove manufacturing, Rate Variances should be relatively minor and

Efficiency Variances need further breakdown to be useful. Hence, one Total Variance and all of the component variances should be used. The Rate component can be shown as a separate item or it can be combined with another component (such as "allowances") if it occurs very infrequently.

The total Direct Labor variance (for a department or the entire plant or even an operation, if this were desired) is calculated as follows:

Total Direct Labor Variance	=	Total Direct Labor Payroll	-	Total Standard Labor Cost

This Total Variance can be broken out into as many components as are useful for a particular situation. Among the components that might be used are the following:

Overtime Premium
Repairs Cost
Samples Cost
Regular make-up (incentive operations)
Equivalent make-up for direct time work operations (estimated or calculated)
Special payments for Non-Std Conditions
Time Work payments for Non-Std Conditions, etc.

The ratio of the Total Direct Labor to the Total Standard Labor is called the Direct Labor Cost Ratio (expressed either as a decimal or a percentage). This Ratio is a highly useful indicator of weekly (cost) efficiency for a department, a plant, etc., and it is very effectively used in product costing by selecting a Standard Cost Ratio. This has been explained previously in the section on Product Costing.

Departmental Indirect Labor can be treated in one of various ways:

(1) It can be included in Manufacturing Overhead

(2) It can be calculated as a ratio to Standard Labor and then added to the Direct Labor Cost Ratio for a total Labor Cost Ratio

(3) It can be considered as one of the variance components of Direct Labor, and as in (2) the total Labor Cost Ratio would include departmental Indirect Labor

For small companies, the third approach is practical. Plantwide Indirect Labor would be included in Manufacturing Overhead.

As a means of monitoring labor costs week by week, the Cost Ratio should be calculated for each department and for the plant as a whole. (For product costing, it is a management decision whether to use a single plantwide Standard Cost Ratio, or to use a separate ratio for each department).

An example of a computerized Weekly Labor Cost Analysis is shown on a following page (Exhibit 29). Also, shown is an illustrative form for a manual Weekly Gross Payroll/Labor Cost Analysis (Exhibit 28). An ideal Variance analysis will show for each week:

(1) The total Variance $ and the $ for each component Variance.

(2) The Total Cost Ratio and the ratio for each component Variance.

For each department and for the plant as a whole, there should be each week a 26-week Trend Report to quickly show the trends of variances over a reasonable period of time. Exhibit 30 is an illustration of this type of report.

On a daily basis, absentee, overtime, and high/low performance reports are worth considering.

On a weekly basis, operation (work center) summary reports are useful, as well as Make-Up and Indirect reports.

Exactly which and how many reports will be cost effective in a particular situation will depend on the size of the company and the environment in which it operates. Nevertheless, the above is meant to give an indication of how labor costs can be effectively managed.

Exhibit 27

VARIANCE REPORT - DIRECT LABOR

Plant: Period Length: From: To:

Element of Cost	Current Period			Year to Date		
	Budget	Actual	Variance	Budget	Actual	Variance
Department A						
Measured or Incentive						
Addt'l Costs Incl in Cost Ratio						
Other Labor						
Department B						
Measured or Incentive						
Addt'l Costs Incl in Cost Ratio						
Other Labor						
Department C						
Measured or Incentive						
Addt'l Costs Incl in Cost Ratio						
Other Labor						
Department D						
Measured or Incentive						
Addt'l Costs Incl in Cost Ratio						
Other Labor						
Department E						
Measured or Incentive						
Addt'l Costs Incl in Cost Ratio						
Other Labor						
Department F						
Total Direct Labor						
Department G						
Total Direct Labor						
TOTALS						

Exhibit 28

WEEKLY GROSS PAYROLL/LABOR COST ANALYSIS

Plant: Dept: Payroll Week Ending:

Employee		Hours		Earnings			Direct Labor					N-Std In	Other Time Work			
									Direct Time Work							
Clk #	Name	Reg	O.T.	Gross	Reg	OTP	Incen DL or Std	M-U	Total	Std	MU	Amt/Code	Indirect Amt/Code	Reprs	Smpls	Non-Std Amt/Code
Totals																

04/20/81 (81110) LABOR ACCOUNTING SYSTEM *** WEEKLY LABOR - COST ANALYSIS *** WK:17 REPORT NO 422 PG 9

WEEK ENDS: 04/18/81 PAY DATE: 04/24/81
QTD WEEKS INFO: 4 YTD WEEKS INFO: 17
QTD CALENDAR WK: 4 YTD CALENDAR WK: 17

***** CO COST STAND ANALYSIS ***** DEPT. 99

		THIS WEEK		QUARTER TO DATE		YEAR TO DATE		COST RATIOS			
	MAN-WK	$	GAIN/LOSS	$	GAIN/LOSS	$	GAIN/LOSS	STD	WEEK	QTR	YTD
PRIMARY INC EARNINGS		46784		215306		864932			87.2	85.4	87.5
SPECIAL GUARANTEE		739		3101		11650			1.4	1.2	1.2
TRAINEES INC EARNINGS		2312		10143		29562			4.3	4.0	3.0
MEASURED THWK EARNINGS											
UNMEASURED THWK EARN 65%	39	3836		23427		82105			7.1	9.3	8.3
TOTAL PRODUCTIVE EARNINGS	322	53671		251977		988249			100.0	100.0	100.0
WEEKLY MINIMUM MKUP		755	218.4-	3408	887.0-	12186	2302.6-	1.0	1.4	1.4	1.2
SPEC GUARANTEE MKUP		459	297.9-	1794	1035.6-	6322	3350.2-	.3	.9	.7	.6
TRAINEES COST		852	851.2-	5312	5311.7-	16749	16740.9-		1.6	2.1	1.7
MEASURED THWK MAKE UP											
UNMEASURED THWK MKUP 35%		2065	833.0	12614	992.8	44210	9161.1	5.4	3.8	5.0	4.5
OFF-CYCLE G											
OFF-CYCLE M											
SHORT STATION											
SAMPLES		1285	426.1-	5557	1625.2-	24784	8963.4-	1.6	2.4	2.2	2.5
REPAIRS		1466	714.4-	7341	3812.4-	29463	15624.2-	1.4	2.7	2.9	3.0
DOWN TIME		71	70.3-	311	309.9-	1079	1077.2-		.1	.1	.1
WAITING TIME				3	2.5-	21	19.8-				
INDIRECT TIMEWORK		6748	2376.5	35355	7483.7	142510	25496.8	17.0	12.6	14.8	14.4
OVER TIME		1056	1055.7-	8429	8428.6-	19336	19330.2-		2.0	3.3	2.0
ADDONS											
SHIFT BONUS											
ADJUSTMENTS & OTHER		67	66.6-	198	196.5-	273	266.8-		.1	.1	
TOTAL UNPRODUCTIVE EARN.		14824		80423		296932		26.7	27.6	31.9	30.0
GROSS (BEFORE HOL + VAC)		68495	493.8-	332400	13143.1-	1285182	33066.8-	126.7	127.6	131.9	130.0
HOLIDAY + VACATION		13982		14093		44667					
TOTAL GROSS PAY		82477		346492		1329848					
# OF HOME DPT EMP/TRNS IN		486		489		463					
TOT HRS TRANSFERED IN/OUT											
TOT HRS WRKD/AVG HPS WRKD		15324	31	74376	38	287698	37				
AVG HRLY INC ERN/TOT ERND		4.39	4.47	4.37	4.47	4.46	4.47				
PRODUCTION EFFICIENCY		117		115		118					
UNITS PRODD/COST PER UNIT		43524	1.57	205056	1.62	817380	1.57				

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RUN : 10/12/81
TIME: 22:52:50

WEEKLY COST ANALYSIS TREND REPORT 424
CO. INC.

WK END: 10/10/81 PAGE 3
WK NO: 42
PAID: 10/16/81 DAY 285

*** DEPARTMENT 5 DEPT ***

W/E DATE	COST RATIO	VARB WEEK	VARB YTD	GROSS PAY	TOTAL PRO $	TOTAL INC	DIRECT TMWR $	TOTAL IN-PRD	IND TMW $	MK-UP	SHPL	REPR	CVT $	ALL OTH $	* EMPLOYEES * TOT	TMW	INC	M-U	TOT $/HR	INC $/HR	PAIRS PROD.	COST /PAIR
10/10	129.6	3272-	110952-	24270	13697	17075	1623	5572	2235	1875	186	760	363	152	135	20	115	36	4.62	4.37	44316	.55
10/03	125.2	3083-	107681-	24049	19302	17978	1503	5467	2617	1708	179	379	438	147	137	15	122	40	4.60	4.42	47016	.53
09/26	127.0	3022-	104556-	26045	20501	16711	1790	5544	2435	1636	314	313	569	277	139	17	121	32	4.61	4.48	47016	.55
09/19	129.3	3265-	101578-	24681	19246	17150	2098	5633	2298	2059	160	442	574	101	140	19	121	38	4.62	4.38	41616	.60
09/12	132.4	2913-	98313-	19195	14499	13009	1490	4696	1852	1659	333	319	353	181	136	17	119	37	4.58	4.31	30240	.64
09/05	135.6	3018-	95401-	22182	16353	14203	2070	5829	2109	1937	615	527	175	465	135	16	119	37	4.56	4.36	34596	.64
08/29	129.1	2779-	91579-	25395	20139	18631	1508	5255	2014	1913	375	482	179	313	143	13	130	41	4.63	4.45	46656	.54
08/22	127.0	3050-	88759-	26378	20772	18161	2611	5606	2156	2024	221	379	642	184	147	14	133	48	4.57	4.44	42084	.63
08/15	127.9	2969-	85752-	24307	19001	16324	2677	5306	2139	1839	292	454	372	211	140	17	123	38	4.65	4.55	40536	.60
08/08	135.4	4523-	82785-	25800	18768	16280	2488	6832	2208	2230	97	741	360	1195	143	16	127	36	4.90	4.43	44676	.57
08/01	124.0	2440-	78256-	24327	19459	18251	1233	4837	2219	1629	246	513	96	135	146	17	129	40	4.68	4.55	44244	.55
07/25	125.5	2652-	75817-	25250	20123	18453	1670	5127	2266	1690	162	369	172	467	146	15	131	40	4.60	4.50	36000	.70
07/18	129.7	2906-	73165-	25545	20160	18546	1613	5355	2263	1922	152	322	84	643	152	18	134	59	4.48	4.29	39600	.65
07/11	.0	117-	70259-	117	0	0	0	117	92	25	0	0	0	0	15	15	0	2	5.08	4.29	39600	.00
06/27	122.9	2358-	70144-	27237	22154	20678	1475	5084	2032	1466	277	436	265	608	158	19	139	45	4.58	4.51	39600	.69
06/20	125.5	3063-	67788-	29197	23271	21345	1926	5926	2203	1947	220	307	655	594	155	15	143	55	4.59	4.38	39600	.74
07/06	.0	0	64723-	0	0	0	0	0	0	0	0	0	0	0	117	117	0	0	4.59	4.38	0	.00
06/13	122.9	2505-	64723-	29055	23642	22351	1291	5413	2295	1590	83	347	693	405	155	17	138	44	4.64	4.48	42300	.69
06/06	123.3	2623-	62218-	29359	23807	22333	1474	5552	2168	1603	80	538	850	314	151	16	135	47	4.70	4.50	43020	.68
05/30	125.9	2736-	59596-	23731	18696	16881	1815	5035	1730	1565	80	369	939	352	149	19	130	41	4.74	4.53	32184	.74
05/23	124.4	2647-	56857-	27193	21857	19789	2068	5335	2010	1818	156	570	335	446	149	16	133	45	4.57	4.47	39672	.69
05/16	125.6	2961-	54211-	23009	22305	20467	1838	5705	2093	1995	168	518	627	303	149	14	135	52	4.67	4.46	40752	.69
05/09	124.5	2644-	51252-	26590	21562	19831	1751	5298	2170	1775	216	517	433	188	148	15	133	44	4.54	4.37	42480	.63
05/02	123.3	2425-	48609-	27197	22060	20602	1458	5133	2216	1659	215	318	572	157	149	15	134	54	4.59	4.42	43452	.63
04/25	123.0	2591-	46183-	27061	22502	21412	1090	5359	2025	1523	147	489	952	224	146	14	132	53	4.65	4.40	35640	.78
04/18	123.9	1921-	43593-	20527	16566	15757	811	3958	1680	1426	187	308	254	104	144	15	129	55	4.46	4.20	29124	.71

Exhibit 30

Timely analytical reports must be generated

Management must learn how to effectively use such timely information that clearly reveals labor performance in all its significant details.

D3.4 Cost Management of Operating Expenses

Operating overhead expenses, which are not part of inventory costs, are best controlled by Budgetary Control, and the variance analysis similar to that described for Manufacturing Overhead can be used. The most usual variances are the Total Variance with a Budget and a Volume component. The budget for each category of Operating Expenses (Distribution, Selling, General and Administrative) should be separated into Fixed and Variable and the annual budget should be broken out into monthly or 4-4-5 week intervals. Exhibits 21, 22, and 23 show one type of Variance Report forms.

Each element of cost can be categorized as a controllable or non-controllable item. These designations only have meaning in the short run. In the long run all items of cost are controllable. In the non-controllable category are taxes, insurance, depreciation, rent. In the controllable category are travel and

entertainment, advertising, warehouse labor, bonuses, sample expenses. Other costs must be categorized by each management in each situation. Non-controllable items should be coded as such. Those items which show significantly high variances should be given managerial attention.

D3.5 Analysis of Contribution Margin - by Product Group and by other classifications

One major advantage of direct costing as against full absorption costing, is the ability to analyze contribution by product group or by individual product. Contribution is simply the difference between net sales and the total variable cost of sales. Hence, changes in contribution have full impact on the bottom line of net profit, which is a key advantage of variable costing.

In the analysis of sales to determine the effectiveness of the marketing arm of the company, the most usual approaches are:

1. Analysis of sales statistics only
2. Analysis by sales by gross profit
3. Analysis by sales by contribution

It is all too obvious that sales in themselves do not indicate how well a company is doing in its selling. The more fundamental factor is how much profit does each sale generate. Gross profit analysis shows more than sales alone. Contribution analysis shows how net profit will be affected.

The total contribution developed by all of the company's sales ought to be large enough to yield a satisfactory total net profit, but the only absolute requirement for a particular product is that it develop some positive contribution at least in the short run. Of course, ideally each product should develop the standard contribution, and deviations from the standard will represent favorable or unfavorable variances. These total contribution variances by product group or by product, by territory and by customer class, would provide useful insight as to where products should be emphasized or deemphasized.

Where a more detailed analysis is desired, and where the calculation effort is determined to be justified by the benefit, the total contribution variance will be broken down in three categories:

Contribution price variance

Contribution volume variance

Contribution product mix variance

Such analysis will typically require a computer.

This type of analysis is especially relevant in a highly competitive price-conscious market, such as exists in the work glove industry.

Exhibits 31 and 32 illustrate some formats for Margin Contribution Analysis and Gross Profit Analysis.

D4. Standard Cost Accounting System

D4.1 General

A standard cost accounting system will differ in many details from one situation to another. However, as a quick way of providing an overall perspective on how the accounting itself will differ from a conventional accounting system, a list of typical transactions is recorded below in General Journal format with all variances shown as unfavorable. This is done for the sake of simplicity in illustration. Assumed amounts are used to facilitate understanding of the transactions.

From a purely accounting point of view, it should be remembered that one of the basic advantages of a standard cost accounting system is that all manufacturing costs (labor, materials, mfg overhead) and inventories are accumulated at standard and this is a significant simplification. This factor is often a key element in a company's decision to have a standard cost accounting system. Manufacturing variances are accumulated for convenient periods of time and these provide the adjustment to standard to reflect actual.

MARGIN CONTRIBUTION ANALYSIS BY PRODUCT GROUP

Period Length: From: To:

Product Group	Net Sales	Variable Expenses							Contribution		
		Std Var Mfg Cost	Mfg Cost Variance	Std Var Oper Exp	Oper Exp Variance	Sales PriceVar	Inventry Adjust	Total	$	% of Sales	% of Total C

GROSS PROFIT ANALYSIS OF SALES

☐ BASED ON STANDARD COSTS ☐ BASED ON ACTUAL COSTS

Product Group: Period Length: From: To:

Style No.	Reg or Std SPrice	Price Var		Actual Sellng Price	Qty	Sales	Manufacturing Costs				Gross Profit		Tot Cst W/ Oper Expense	Net Profit	
		$	%				Mat'l	Labor	Overhd	Total	$	%		$	%
Totals															

D4.2 Illustrative Transactions - Standard Cost Accounting System
(Using Debit Variances - Unfavorable)

1.a <u>Direct Materials</u> (Purchase)
When materials are purchased on account

Data: 6,000 yards purchased
Std P = $1.00 per yard
Act P = $1.10 per yard

Calculations: Price Var = (Act Unit Cost - Std Unit Cost) x Units Purchased = (1.10 - 1.00) x 6,000 = +600

Raw Materials Inventory (at Std Price)	6,000	
RM Price Variance	600	
Accounts Payable		6,600

1.b <u>Direct Materials</u> (use)
When materials are used for production

Data: 5,000 yards used to provide 1,800 doz.
Std Qty = 2.50 yards/doz.

Calculations: Usage Var = (Act Qty - Std Qty) x Std Unit Cost
= (5,000 - 4,500) x 1.00 = +500

*Std Qty at Std Price = 1800 doz x 2.50 yds/doz x $1.00/yd = $4,500
**Actual Qty at Std Price = 5,000 x $1.00 = $5,000

Work in Process (Std Qty at Std Price)*	4,500	
RM Usage Variance	500	
Raw Materials Inventory**		5,000

2. <u>Direct Labor</u> (Rate Var)
To distribute Factory Payroll to appropriate accounts

Data: Total Payroll ---------- 9,500
Indirect Assignable to Mfg Ovhd ---------- 700
Direct Labor
2000 DLH x $4.40/Hr(Ave) ---------- 8,800

Std (Ave) Rate per hour - $4.00/hr

Calculations: Wage Rate Var = (Act Rate-Std Rate) x Act Hrs Worked
= (4.40 - 4.00) x 2000 = +800

*Actual DLH x Std Rate = 2000 x 4.00 = 8,000

Direct Labor (Act DLH at Std Rate)*	8,000	
Wage Rate Variance	800	
Mfg Overhead	700	
Payroll Payable (Actual)		9,500

2b. <u>Direct Labor</u> (Efficiency Var)
To transfer Direct Labor to Work In Process

Data: Direct Labor as shown in (3.)
Production - 1,800 doz
Std DLH per doz = 1.05 DLH per doz.

Std DLH for production = 1800 x 1.05 = 1,890 Std DLH
Calculations: Efficiency Var = (Act Hrs - Std Hrs) x Std Rate/Hour
= (2000 - 1890) x 4.00 = +440

*Std DLH at Std Rate = 1,890 x $4.00 = 7,560
**Act DLH at Std Rate = 2000 x 4.00 = 8,000

Work in Process*	7,560	
DL Efficiency Var	440	
Direct Labor**		8,000

3.a <u>Manufacturing Overhead</u> (Actual Cost)
When overhead costs are incurred (other than overhead labor already shown in 3a) for the accounting period.

Data:

Amount of prepaid insurance expired during period	- 1,000
Factory supplies purchased for cash	- 2,800
Machinery depreciation for period	- 1,400
Taxes accrued for period	- 1,300
Other mfg ovhd items purchased on account	- 3,500
	10,000

Manufacturing Overhead	10,000	
Prepaid Insurance		1,000
Cash		2,800
Depreciation		1,400
Taxes Payable		1,300
Accounts Payable		3,500

3.b <u>Manufacturing Overhead</u> (Applied)
When applied manufacturing overhead has been calculated

Data: Standard Overhead Rate = $4.80 per Std DLH
Production - 1,800 doz
Std DLH per doz - 1.05 DLH per doz
Std DLH for production = 1800 doz x 1.05 = 1,890 Std DLH

Calculations: *Applied Overhead = $4.80 x 1,890 = 9,072

Actual DLh = 2,000 Budgeted DLH = 1,920
Fixed Ovhd Rate = 3,840/1,920 = $2.00/DLH
Variable Ovhd Rate = 5,760/1,920 = $3.00/DLH
Total Mfg Ovhd = 10,000 + 700 = 10,700
Total Mfg Ovhd Variance = 10,700 - 9,072 = +1,628(U)

Budget Var = Act Mfg Ovhd-(Flex) Budg for Std DLH of Production
= 10,700-(3,840+1,890x$3.00)=10,700-9,510 = +1,190(U)
Volume Var = (Flex) Budg for Std DLH or Prod - Act Mfg Ovhd
= 9,510 - 9,072 = +438(U)
Total Mfg Ovhd Var = +1,190 + 438 = +1,628(U)

Work-in-Process*	9,072	
Budget Variance	1,190	
Volume Variance	438	
Manufacturing Overhead		10,700

4. Finished Goods

Finished Goods
When completed product is transferred to Finished Goods

Data: 1,600 doz are completed and sent to the finished goods warehouse
Std cost per doz = $11.74

Calculations: 1,600 doz x $11.74/doz = Std Cost of completed product = 18,784

Finished Goods	18,784	
Work in Process		38,720

5. Sale of Finished Goods

When finished goods are shipped to a customer

Data: 1,500 doz are sold for $20.00 per doz

Calculation: Total Sale = 1,500 x 20.00 = $30,000
Finished Goods(at Std) = 1,500 x 11.74 = $17,610

Accounts Receivable	30,000	
Sales		30,000
Cost of Goods Sold	17,610	
Finished Goods		17,610

6. Variance Accounts

When variance accounts are closed to Cost of Goods Sold at end of the year.

Data: Assuming all of the above transactions are for a year. (Variance accounts will usually be maintained from month to month as deferred debits or credit.)

Cost of Goods Sold		
RM Price Variance	2,968	
RM Usage Variance		600
DL Rate Variance		500
DL Efficiency Variance		800
MO Budget Variance		440
MO Volume Variance		1,190
		438

The net effect of the transactions is that the Goods Sold actually cost $2,968 more than standard.

D5. Options for the Smaller Company

D5.1 Cost System Options

The aim of this Manual has been to discuss some of the Cost System needs of the smaller company of the work glove industry. The range of options and details that could be considered is virtually unlimited. A brief summary of key options with some short comments that relate to a small manufacturer's point of view may be helpful in providing general direction, which is the primary purpose of this Manual. (The items below have been previously discussed in more detail.)

Process Costing vs. Job Costing - Each product (style) obviously has to have its own cost sheet, so as to provide a basis for pricing. However, in accumulating production costs, wherever possible, the process cost approach should be favored, since it is easier and if products are sufficiently similar, will often provide better management information. However, overall there is a major use for process costing and some limited use for a job costing approach. Where labor is concerned, departmental costs (process costing) are most useful. Only if a job or a product is highly unique, and causes variances that are significantly different from other products, should limited job costing be considered. Labor Variance data is most usefully broken down by type of Variance, by department. Other data should be shown by operation. This is a process costing approach.

Material Price Variance data is based on accumulating data by each purchase of each material. Material Usage control of cut materials is best done by accumulating data for each cutting job, which may involve one or more styles. Gains and losses (variances) should be accumulated for each Cutter, for each material, and for each style or group of styles. This has elements of both job and process costing.

Manufacturing Overhead should normally be handled on a departmental (process) basis.

Full absorption costing vs Variable Costing - Full absorption costing is a must; variable costing is an option, but an option worth considering as an addition to absorption costing, at least for the product cost sheet. It also provides useful information for Sales/Profit/Volume analyses.

Range of Variances - There is a wide range of possible variances. Those that should be considered as minimum:

Total Labor Variance (including Efficiency and Rate)
Labor Variance components from a detailed labor Cost Analysis
Material Price Variance (by material)
Material Usage Variance (by material, by style, by cutter if cut material is involved)
Manufacturing Overhead Budget
Manufacturing Overhead Volume
Sales Variances
Operating Expense Variances

Budgetary Control vs Comparison of Income Statements

Comparing financial statements on an annual and interim basis is obviously useful to management (although this will depend in part on the accuracy of interim inventory figures). However, income statements look at the past. Budgetary Control, on the other hand, is based on a forward looking plan, which is regularly checked by the latest actual past results. Budgetary Control is a management technique, is a routine process of planning, analyzing results and replanning. In some companies it becomes a style of management and a way of life. With standards and budgets any company can to some degree avail itself of this useful technique.

Exhibit 33 illustrates a format for a Standard Cost Accounting System Income Statement showing manufacturing variances.

D5.2 Standard vs Actual Cost Accounting System

One very useful(and common) approach for small companies is to use a conventional accounting system with a conventional chart of accounts, as per an actual cost system. However, for manufacturing overhead, a predetermined overhead rate (P Ovhd R) is determined and used. Such an approach gives many of the advantages of a P Ovhd R: costing can be done quickly at any time and the overhead fluctuations from month to month of actual cost systems are avoided.

Exhibit 33

INCOME STATEMENT FOR STANDARD COST ACCOUNTING SYSTEM

Period Length: From: To:

Item	Current Period		Year to Date	
	$	%	$	%
Gross Sales				
Less: Returns & Allowances				
Discounts				
Net Sales		100.0		100.0
Cost of Goods Sold At Standard				
Purchase Price Var				
Material Usage Var				
Direct Labor Var				
Total Mfg Overhead Variances				
Loss on Off-Price Sales (Sales Price Var)				
Other Adjustments				
Total Cost of Goods Sold				
Gross Profit				
Operating Expenses				
Distribution				
Selling				
General & Admin				
Total Operating Expenses				
Operating Income				
Other Income:				
Other Expenses:				
Net Income - Before Taxes				
Provision for Income Taxes				
Net Income - After Taxes				

Some key transactions that would take place can be illustrated by the following, again in General Journal format, again illustrating an unfavorable variance.

1. <u>Manufacturing Overhead (actual cost)</u>
   When overhead costs are incurred

   Data: Manufacturing Overhead incurred - Total 10,000
   to be credited to various accounts

Manufacturng Overhead	10,000	
"Various Accounts"		10,000

2. <u>Manufacturing Overhead (applied)</u>
   When applied manufacturing overhead has been calculated

   Data: Manufacturing Overhead applied = 9,072

Work in Process	9,072	
Manufacturing Overhead		9,072

At the end of the month, there would be a debit balance in Manufacturing Overhead (which would in effect be an unfavorable Mfg Ovhd Variance) which is usually referred to as Underapplied or Underabsorbed Overhead.

On interim statements, this will usually be shown as a plus adjustment to inventory. On a year end statement, it will usually (but not always) be reflected in the total inventory (pro-rated to work in process, finished goods, cost of goods sold).

It will be useful to note here that in such a system, it is fairly common to have a Mfg Ovhd Control account, a Mfg Ovhd Applied account, and an Under/Over Applied account. (In Standard Cost Accounting System, it is fairly common to have both a Control and Applied account for Manufacturing Overhead.) In many situations these additional accounts are convenient. However, the accounting principles are the same for either the one Mfg Ovhd account approach or the three Mfg Ovhd account approach.

With the conventional accounting system above that makes use of a P Ovhd R, it is also possible to have whatever degree of Variance Analysis and Budgetary Control through reports that are not tied in with the General Ledger.

The total Manufacturing Overhead Variance (which is the Under/Over Applied Mfg Overhead) can be analyzed with two components, three components or four components depending on how much detail and analysis one feels is cost justified. A good first approach is to have sufficient detail to calculate two variances - Budget and Volume.

For materials, usage variances are nearly always worth the effort since very large dollar values are involved, and control usually provides significant benefit. Price Variances are also useful, and typically are not difficult to accumulate. This is especially true if a computer is available.

In a labor-intensive industry such as work gloves, labor cost control is of major importance since it affects both labor cost and capacity. With a properly designed payroll system, variances can be calculated to any degree of refinement that is determined to be useful.

In order to develop the above Labor, Material, and Manufacturing Overhead Variances, it is, of course, necessary to have Labor Standards, Material Standards and Manufacturing Overhead Predetermined Rates based on a budget. Since these are the essentials for Product Costing, it simply means that if one is to have effective Product Costing, one automatically has, at the same time, the essential ingredients for Cost Management.

As a smaller company grows in size and complexity, it should be obvious by now that the basic approach just described could very logically evolve at a future time into a comprehensive Standard Cost Accounting System, using Budgetary Control. Such a system, when properly designed, implemented and managed, can provide a solid foundation for excellent management.